

Childhood Immunization Coverage

Birth Certificate Followback Study

Clark County, 1999

Southwest Washington Health District

Assessment and Research

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Executive Summary

Immunization of young children in Clark County remains of great concern for protecting the health of the community. The Clark County Childhood Immunization Study was undertaken to identify the current childhood (19-35 months old) immunization rate. The study was also needed to compare the rate to the 1994 rate as well as to collect information on the demographics of the child and parent and also to collect information about the child's health, health care, and immunization history. This survey found 67% of Clark County children were fully vaccinated for Diphtheria, Tetanus, Pertussis (DIP), Polio, Measles, Mumps, and Rubella (MMR) (4:3:1 series) at 19-35 months of age compared to 66% found in the 1994 survey.

The study was designed to determine verified, combined and antigen specific immunization coverage rates of Clark County children 19-35 months of age at the time the sample was drawn. The birth certificate follow back methodology was chosen over cluster sampling because of financial and personnel resources. The study used multiple methods of contacting parents including by telephone calls, visits to the residence, and mailings.

There were 250 children randomly drawn into the sample out of approximately 7,000 births from the study population. Parents of 203 out of the 248 eligible subject children completed surveys for a response rate of 82%. There were 32 (15.7%) parents that could not be contacted for reasons including vacant houses, incorrect addresses, and persons not responding to multiple attempts to contact them on the phone, in person or by mail. Altogether, 13 families (6.4%) refused to participate in the survey. The survey asked parents for their record of their child's immunization. In addition, verification of immunization dates with health care providers was completed when possible.

Three interesting points were derived from the survey questions. Most children in the survey had health insurance coverage and had a regular health care provider. About half of the parents reported experiencing barriers such as cost, transportation, or inconvenient clinic hours when having their child immunized although no single barrier was of concern over other barriers. Nearly half of respondents, mainly mothers, were not employed during their child's first year and a half.

Information reported on immunization coverage level provided some additional facts concerning childhood immunizations. Combining parent and provider information on immunization dates gave a more complete picture of the child's immunization status because neither parent nor health care provider necessarily had a complete record of the child's immunizations. There were some children (11%) who had most of their immunizations but were one health care provider visit short of completing the recommended immunization schedule by 35 months of age. When a child saw a health care provider four or more times during the second year of life, the child was more likely to be fully immunized. Also, children who had not moved at all or only once were more likely to have had all of their immunizations. Children of parents who had records of their child's immunizations were much more likely than other children to be fully immunized.

The national target set by the Healthy People 2000 federal initiative is to have at least 90% of children fully immunized for the 4:3:1 series by 35 months of age. Currently, Clark County is far from this goal. Overall the low results of the childhood immunization study (67% fully immunized) were very surprising since there was essentially no improvement from the 1994 immunization study and there had been a strong effort within the community to improve the childhood immunization status. Children in Clark County deserve to have a better level of protection against vaccine-preventable diseases. The survey results will be shared with the community and will help identify areas and methods for improvement.

Introduction

Children are one of any community's most important resources. Their health and welfare is of concern to public health agencies and the entire community. It is important that public health agencies stay updated on the trends of any diseases and health care policies that could affect the health of a community's children.

The childhood immunization rate is one of the leading health indicators of a community. Following clean drinking water and sanitation, childhood immunizations are considered the next most important public health accomplishment that improved the health of the community over the last century (Taylor, Darden, Slora, Hasemeier, Asmussen, & Wasserman, 1997). The number of vaccine-preventable diseases has declined dramatically since the introduction of each disease specific vaccine (Table 1). Recommended immunizations for children protect against serious disease, potential complications, and in some cases death. Public health officials frequently review rates and trends of vaccine-preventable diseases and find it important to know the childhood immunization rate in a community (Bolton, Hussain, Hadjipaw, Holt, Hughart, & Guyer, 1998). An inverse relationship for potential cases or outbreaks of vaccine-preventable diseases exists as the rate of childhood immunization increases (Zell, Deitz, Stevenson, Cochi, & Bruce, 1994). When children are underimmunized, they pose a risk not only to themselves but also to the entire community as a reservoir for disease (Pritchard, Bell, & Levensen, 1995).

Table 1. Comparison of Maximum, 1993 and 1997 Morbidity
From Vaccine-Preventable Diseases

Disease (Year Vaccine Introduced)	Maximum cases (year)	1993 Incidence	1997 Incidence
Diphtheria (1925)	206,939 (1921)	0	5
Measles (1960)	894,134 (1941)	312	135
Mumps (1967)	152,209 (1968)	1,692	612
Pertussis (1925)	265,269 (1934)	6,586	5,519
Poliomyelitis (1954)	21,269 (1962)	0	0
Rubella (1966)	47,686 (1959)	192	161
Tetanus Toxoid (1925)	601 (1948)	48	43

Sources: CDC, MMWR 42(51&52), 1994; West & Kopp, 1999.

Immunizations are considered a very safe and cost-effective method of protecting the health of children. It has been noted that for every dollar spent on measles vaccine, fourteen dollars is saved on health care costs and time off work. Resources used for immunizations are considered extremely beneficial for improving the health of the community (Taylor, Darden, Slora, Hasemeier, Asmussen, & Wasserman, 1997).

In 1994, the Southwest Washington Health District (SWWHD), in conjunction with the Washington State Department of Health (DOH), conducted a childhood immunization cluster study that showed by 35 months of age 66% of Clark County children had up-to-date coverage of the 4:3:1 (4 Diphtheria, Tetanus, Pertussis (DTP), 3 Polio, 1 Measles, Mumps and Rubella (MMR)) vaccination series (Southwest Washington Health District, 1994). The National Immunization Survey (NIS) uses the age category of 19-35 months when assessing the immunization status of young children (Zell, Deitz, Stevenson, Cochi, & Bruce, 1994). Clark County failed to meet national and state goals of 90% for childhood immunizations. These goals were set by the Healthy People 2000 federal health initiative and the Washington State Public Health Improvement Plan (Washington State Department of Health, 1994).

Since 1994, there have been increased efforts to assure improved immunizations for children. These efforts included: provider education, community awareness, tracking vaccine distribution and administration, providing free vaccines to community physicians' offices, advertising, billboard campaigns, free immunizations the first Saturday of each month, and Kiwanis sponsored free immunization events. These efforts reflected a strong commitment among health care providers to protect the children in the community against vaccine-preventable diseases by increasing the rate of childhood immunization. These efforts have been beneficial to both the community and SWWHD. This collaboration was crucial to helping Clark County attempt to move closer to national and state goals.

Clark County experienced a measles outbreak in 1996. Although there were no deaths related to this outbreak, the cost to Clark County's community and families was substantial. Significant resources were needed to contain and stop the spread of this vaccine-preventable disease. Estimated cost of the outbreak came close to one million dollars. The resulting burden, both financial and other resources, was experienced by SWWHD, DOH, Centers for Disease Control and Prevention (CDC), Clark County health care providers, Southwest Washington Medical Center, and the many community members who assisted in preventing the spread of measles. CDC provided extra additional vaccine to supplement what was available through SWWHD and DOH (Southwest Washington Health District, 1996).

It is important to assess the immunization rate of young children and to map the trends of a community's immunization coverage. More recent data on the childhood immunization rate was needed to determine if Clark County had moved closer toward meeting national and state goals for childhood immunizations in an effort to better protect children from disability, disease, and death. West & Kopp (1999) report that most of the time children are fully immunized at the time of school entry; however, there is no legal mandate stating that children must be immunized by two years old when they are most vulnerable to the devastating effects of vaccine-preventable diseases. Children remain a high priority for public health and the community as a whole.

Clark County, Washington is an urban-rural county with an estimated 1998 population of 328,000 (Washington State Office of Financial Management (OFM), 1998). Located in the southwest corner of Washington State, Clark County is bordered by the Columbia River, Skamania County, and Cowlitz County. Clark County's population was predominately white (94%) in 1997 (OFM, 1998). Clark County is a homogenous community with a high rate of immigration from both in-state and out-of-state residents.

In October 1999, SWWHD, with the assistance of DOH undertook another immunization survey of young children. The purpose of the 1999 study was to identify the childhood immunization rate of Clark County for 19-35 month old children. The study also sought to gain additional information about childrens' health care, immunization experience, and barriers to immunizations. The results of the study will be used internally by SWWHD and shared with community health care providers. It will be used to educate parents about childhood immunizations, and inform other community members who contribute to the well being of the children in Clark County. As with other surveys, the hope is to leverage and target scarce resources to specific immunization issues in order to improve immunization rates for the community.

Methods

Study Design

The purpose of this study was to determine verified series and antigen specific immunization coverage rates of Clark County children who were 19-35 months of age at the time the sample was drawn. The birth certificate follow back methodology was chosen over cluster sampling methodology because of limited financial and personnel resources.

Although there has continued to be a large amount of in-migration in Clark County, there has not been a large amount of out-migration which factored into choosing the birth certificate follow back methodology. Other methods such as cluster studies, school immunization records reviews, physician office chart reviews, and other surveys were considered for this study. Each has its own benefits and limitations; however, the birth certificate follow back methodology was chosen because of previous successful projects in local health jurisdictions in Washington State, the support of DCH, and the strong preference of SWWHD Health Officer. The study was chosen to obtain additional information beyond immunization dates from parents regarding access and barriers to immunizations, demographics of the child and parent, and health care coverage and usage.

The birth certificate follow back methodology was designed and used by the Centers for Disease Control and Prevention and also used in similar studies in Washington State. This method calls for a random selection of children born within a specific time period and whose mother was a resident of a specific place (e.g. Clark County). Using address information from the birth certificate record and other sources, the sample population is traced to their most recent known address and telephone number. Once located, in-person interviews are conducted by going to the participants' residence. The Clark County survey modified this protocol by having the telephone as the primary method of contact with survey participants. A limitation of the birth certificate follow back methodology is that it does not assess the immunization status of children 19-35 months of age currently living in Clark County whose mother was not a resident of the county at the time of child's birth. Due to the substantial in-migration experienced in the county during the past decade, this method would not include a large number of children that moved into the county at very young ages. In addition, the method does include a small number of children who were born while his or her mother was a resident but might live elsewhere now.

Study Population and Sample

The study population included children born between September 1, 1996 and January 31, 1998 and born to a mother who was a resident of Clark County at the time of birth. These children would have been between 19 and 35 months of age on August 31, 1999. An estimated 24% of

out-of-state births to Clark County residents (mostly from Oregon) were included in the birth cohort. It was necessary to include all resident births because of the large percentage who are born outside of Washington due to Clark County's proximity to Oregon and its availability of additional birthing centers. Birth and death records were linked to identify infants who had died during their first year of life and to prevent them from being part of the sample that created a modified study population from which to draw the study sample.

A simple random sample of 250 children (+6% @ 95% CI) was drawn from the modified population. DOH staff drew the study sample and delivered a file with all the pertinent information from the birth certificate record on the sample children and parents to SWWHD staff.

Study Protocol

A multi-staged format using different methods of contact was used. The first contact with parents was made by mail to inform the parents that their child was selected for the survey and to ask for their participation. The primary method of survey completion was done by telephone. Consents for release of immunization records were mailed to the home following verification of an address after the telephone interview was completed. If the parents were not reached by telephone, field visits and mailings to the listed residence were attempted.

The original information received on the child included address information from the birth certificate record if available. It was necessary to confirm or identify each parent's current address and telephone number. Because of the extensive nature of these tracing efforts, an independent contractor performed these activities. Tracing efforts to locate parents included numerous resources. Washington State Department of Social and Health Services records, the National Change of Address database, the SWWHD client database, the Internet, and other resources were used as needed to assure the most recent address possible.

Public Announcement

A public service announcement and press release (Appendix A) were issued to increase the community's awareness and understanding of the survey and to increase the overall response rate. In addition, health care providers were notified of the survey. The press release and provider notification were completed prior to any contact with potential survey participants. Their involvement in the verification process and as a resource for concerned parents was crucial for survey success. All SWWHD staff were notified of the survey so that they would be able to verify its legitimacy to any concerned community members or potential survey participants.

Incentives

Participants were informed they would be entered into a drawing for one of several gift certificates to a local retailer. At the end of the interview, participants were asked to return the consent for release of medical records, whether signed or not, to be entered into the drawing. The money for the incentives was donated by Merck and Co. and SmithKline Beecham pharmaceutical companies.

Interviewer Training

Internal SWWHD staff served as interviewers for the project. Five primary interviewers and three additional staff conducted interviews. Two of the interviewers interpreted for Spanish and Russian. An additional interpreter and translator was hired from an interpretation service to assist one of the interviewers in completing three interviews in Vietnamese and to change any written material needed into Vietnamese. Most interviewers had some previous experience collecting information from persons either over the telephone or in person. Interviewer training was held November 10, 1999. Interviewers received a copy of the Interviewer Training Manual. The training included instruction about interviewing techniques and study methodology and procedures. Practice interviews were done as a way to gain experience using the survey instrument and comfort with the role as interviewer. Although interpreters did not attend the interviewer training, one of the trained interviewers oriented the interpreters to interview methods and remained with the interpreter during the interview. Because of its length, the Interviewer Training Manual is not included as part of this report, but it is available through SWWHD.

Contact Methods

The project was designed and developed with a multi-staged approach for completing the survey, including telephone contact, in-person contact, and mailings. Once located, the parent was asked to complete a brief survey about the child's immunization history in addition to some demographic questions such as age, race and income.

Initial Contact

The initial step in contacting the parents of the subject was to mail a postcard to their last known address introducing the project and stating that the project staff would attempt to reach them by telephone in the near future. The postcard mailing (Appendix B) served multiple purposes. It first served as a way to introduce the project, ask for participation, and alert the parents that we would be calling soon. Its secondary purpose was to identify who did not currently reside at the address we had on record. This was accomplished by the Return Service Requested notation on the card itself which alerts the post office to return the postcard with any forwarding address if available or return the postcard stating it was undeliverable if the parents did not reside at the address given.

Primary Method-Telephone

The primary method of data collection was to contact the parents of the subject children by telephone. Efforts were made to locate the correct telephone number for the parents. The protocol allowed for up to 10 telephone call attempts to contact the parents before considering other methods of contact. The 10 telephone calls applied to the parents themselves, although many more than 10 telephone attempts were tried for a lot of subjects in an effort to locate the parents or guardians of the subject child.

Secondary Method-Field Visit

The second approach was to try to contact the parents in person at their residence. If contact was not made with the parents over the telephone or a telephone number was not available, a field visit was conducted to the last known address and any previous addresses if necessary. Field visits to previous addresses of the parents were an attempt to locate them through family possibly still at that address, neighbors, or even current residents who might know where to locate them. If neither parent was available at the residence, interviewers left a letter (Appendix C) asking residents to telephone the project coordinators. The letter introduced the project and asked for the parent's participation. Project staff would then attempt to conduct the survey over the telephone if the parents called the project coordinators. Parents who did not respond to the letter were contacted again in person or by mail.

When it was inconvenient for the parents to participate, the interviewer offered to leave a blank survey form and a pre-addressed pre-paid postage envelope for mailing a self-administered survey. For some parents who preferred, another time was scheduled for the telephone interview.

Third Method-Mailing

The final attempt was to send a letter to the parents asking for their participation in the project. This attempt was used to capture some of the parents who were not reachable either by telephone or in person due to differing schedules.

The final stage of the project was to send a certified letter with the survey enclosed to all parents for whom we were fairly certain we had an accurate mailing address. This was the last attempt to reach parents. The basis for the certified letter was 1) it would reach the intended person, 2) would present the survey as legitimate, and 3) would encourage their participation.

Subject Search Sheet

The interviewer entered information on the Subject Search Sheet (Appendix D) for each subject. The date, method of contact (telephone, in-person, or mail), and outcome code were each recorded. Interviewers could record multiple attempts to contact the parents including up to 10 phone attempts, three in-person attempts at the home, and several attempts by mail. The Subject Search Sheets were pre-printed with child and parent information for ease of use by the interviewer and data entry staff.

Survey Instrument

The survey questionnaire (Appendix E) used in this project was similar to that used in the 1994 survey. This same instrument was used by Spokane County in 1999 and was only slightly modified from the 1998 immunization surveys in Grays Harbor, Grant, Snohomish, and Thurston Counties in Washington State.

The survey instrument contained several sections. First the survey asked the parents about demographics of the subject child such as number of siblings, times child had moved since birth, and primary care giver. The next section asked about the child's health care such as health care provider, insurance coverage, and where the child obtains medical care and immunizations. Then the parent was asked to read the child's immunization dates from the parent's immunization record. Dates provided were recorded on the survey instrument. Next, the parent was asked to provide information about experiences getting the child's immunizations such as knowing when immunizations are due, receiving reminders about appointments, barriers to receiving immunizations, day care attendance, and enrollment in state or federal assistance programs. The final section of the survey asked demographic information about the parent respondent. These questions asked about education, marital status, race, and income. If a parent was not available, someone knowledgeable about the child's health care and immunization history was considered a reliable substitute.

Consent Form for Release of Immunization Record

The parent was also asked to sign a consent form (Appendix F) to contact the health care provider(s) that gave their child immunization(s) so project staff could verify information and collect any missing data. The verification process was explained as a way to investigate whether or not parents and providers each had complete immunization records for the subject children. The consent form was then mailed to the parent along with a self-addressed return envelope.

Tracing of Subjects

Extensive efforts were made to locate a physical and mailing address for the parents as well as a telephone number when possible. An independent contractor performed the following services that proved invaluable to the project.

1. Used a variety of data from Washington State Agencies, including Department of Social and Health Service, Department of Licensing, Child Protective Services, Vital Records (Marriage and Divorce), and others if available.
2. Produced requests for information from the United States Postal Service under the Freedom of Information Act.
3. Performed internet searches and statewide/national phone directory searches as necessary.
4. Provided training to project coordinator and surveyors on tracing activities and techniques.

5. Developed and maintain a database to document, track, and manage all tracing data.
6. Provided regular reports on tracing results and independent consultant's activities.

As the Access database was updated, the file was sent to the contractor so that tracing activities continued throughout the project. The contractor would send the address and telephone information as it became available after searching multiple sources. Some activities included locating potential relatives or neighbors when the parents could not be located. Because the initial information was taken from the birth certificate record and was several years old, the tracing process became essential in order to reach the subjects. The contract for tracing services is included in Appendix G.

Provider Verification

All consent forms received from the parents were sent with a letter of introduction of the project to the health care providers where the child had received immunizations. Staff completed record verification over two-months. The process consisted of acquiring a copy of the child's immunization dates from all health care providers the child used. This information was returned to SWWHD either by mail, fax, or in person. This information was then entered into the appropriate records in the database.

Data Entry, Cleaning, and Analysis

Most of the data collection was completed between November 4, 1999 and January 31, 2000. Beginning on February 1, 2000, data collection efforts focused on mailing the certified letters to parents, encouraging parents to sign and mail back their consent forms for health care provider records of immunizations, and acquiring the immunization information from the provider offices.

Project coordinators entered information collected on the Subject Search Sheet into a database created in Microsoft Access. This daily effort of updating the Access database was critical as the database was the most complete record of updated information on the study subjects. It was vital to our tracing activities to keep the database as complete and up-to-date as possible.

Staff entered data from the survey questionnaires into Excel 5.0 that was later imported into an SPSS 10.0 database. Data cleaning was completed in April and May. Frequencies, cross tabulations and summary statistics were generated using SPSS Base 10.0. Descriptive statistics were conducted for all parts of the survey questionnaire to better understand the elements related to childhood immunizations. Inferential statistics were completed to better understand the likelihood of a child being fully immunized by 35 months of age. Chi square tests were used to determine statistically significant differences. Statistical significance was measured at $p \leq .05$ and $p \leq .01$.

Methodological Results

Survey Response Rate

A response rate of 81.9% was achieved from the 248 eligible children of the sample from the 6,880 Clark County births. There had been 250 children randomly drawn into the sample from which two children were excluded. One child was found whose mother was never a resident of Clark County—a requirement for selection. Another child was deceased at the time of the survey. A number of the subjects, 32 (12.9%), were not contacted for reasons including vacant houses, incorrect addresses, and not responding to multiple attempts to contact them on the phone, in person or by mail. Altogether, 13 (5.2%) verbally refused to participate in the survey.

Contacts

Two hundred and three participants were surveyed (Table 2). Most respondents (n=195) were sent consent forms, 130 were signed and returned and 65 were not signed and returned. Thirteen participants refused to be interviewed, and 32 were unable to be contacted after multiple attempts with different methods. There were 20 of the 32 who were not contacted. They were sent certified mailings because we were fairly certain of their current address. For the other 17 of the 32, all leads had been exhausted and contact with the subject child's parents was not possible.

Table 2. Contacts

	Total Number	Percentage
Sample Size	250	--
Excluded	2	--
Eligible Subjects	248	--
Located	216	87.1%
Refused	13	5.2%
Surveyed	203	81.9%

All potential survey participants were mailed a postcard as initial contact and to inform them of the study. The second contact was made by phone. Overall, 1200 calls were made to reach parents and have them complete the survey (Table 3). An additional 600 calls were necessary to locate parents. The additional calls were made to a variety of homes, relatives, and any potential leads such as neighbors and directory assistance. An average of seven calls was necessary per child in the sample. Calls were strategically made at different times of the day and evening and also on the weekends to maximize chance of contacting parents. A majority of the calls were made in Clark County; however, others were made outside of the county but within the Northwestern region of the United States. Calls were also made to Alabama, Arizona, California, Hawaii, Illinois, New Mexico, Pennsylvania, Texas, and Virginia. A minimum of 10 telephone call attempts to each parent was made before a family was considered a non-contact.

Table 3. Contact Methods

Number of telephone calls to parent	1200
Number of telephone calls to locate parent	600
Number of Field Visits	100
Number of mailings	>320

One hundred field visits were conducted to locate parents or to complete the survey. Field visits covered all regions of Clark County and were conducted on different days of the week, including weekends. Field visits were limited to Clark County and immediate surrounding area (greater Portland, Oregon Metropolitan vicinity).

Twenty certified mailings including the survey and consent form were sent to parents when we were fairly sure of their address. The cost of the certified mailing was \$3.40 per letter. From this mailing, five surveys and signed consents were returned completed yielding a 25% return rate from the certified mailings. Other mailings that were conducted prior to the certified mailings included the 250 postcards as the initial contact and approximately 50 letters that were sent to parents whom we couldn't visit asking for their participation.

Provider Immunization Verification

At the end of the interview, a request was made for consent to verify immunization dates from the child's health care provider(s). Not all of the 203 participants gave their consent to obtain immunization records from their child's health care provider(s). Most agreed verbally to sign the consent form but some did not necessarily return the signed form. There were 144 parents that later returned the written consent to SWHD. The immunization records (dates of shots) for

these children were then requested from their respective health care provider(s). In some cases, participants had multiple providers and therefore each provider was asked to provide that child's immunization history from their record. Immunization records for 136 survey participants were available; however, health care providers could not produce records for eight children in the survey. Providers were given signed consents for release of medical records via mail, fax, and in-person delivery. Before sending consents, contact was made with the medical records department of each health care provider's office to ensure correct address, phone and fax numbers. Attached to the signed consents was a list of the children, their date of birth, and any identification number needed. Providers were given the names, telephone numbers, and fax number of one of the project's coordinators at SWWHD.

Survey Results

Child Demographic Information

At the time of the interview, the average age of eligible children was 30.2 months. Gender distribution of children was 49.8% male and 50.2% female. There were 80 (39.4%) children who had no older siblings. About one half of the children had 1 or 2 older siblings (52.3%). Fewer children (28.1%) had younger siblings in the household. And, 27.6% of eligible children were an only child.

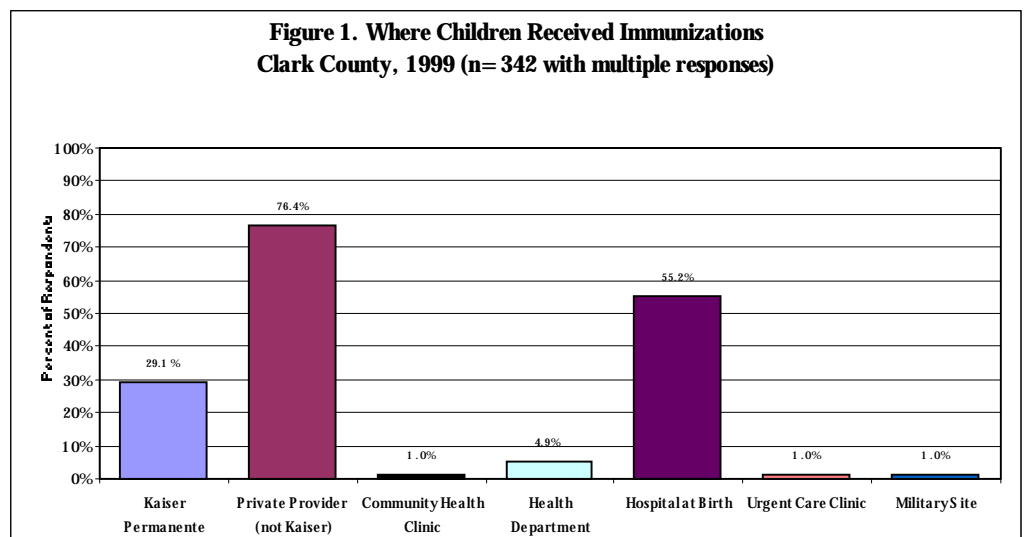
As of November 1999, 184 (90.6%) survey participants lived in Washington State of which 174 (85.7%) lived in Clark County. Overall, the children had not moved residences very much with 40.9% of the them having never moved; however, 25.1% of the children had moved more than once since birth.

Mothers were identified 95.1% of time as the person who usually takes the child for their immunizations followed by fathers at 13.3% (where father was either primary or contributing caregivers).

Child Health Care and Immunizations

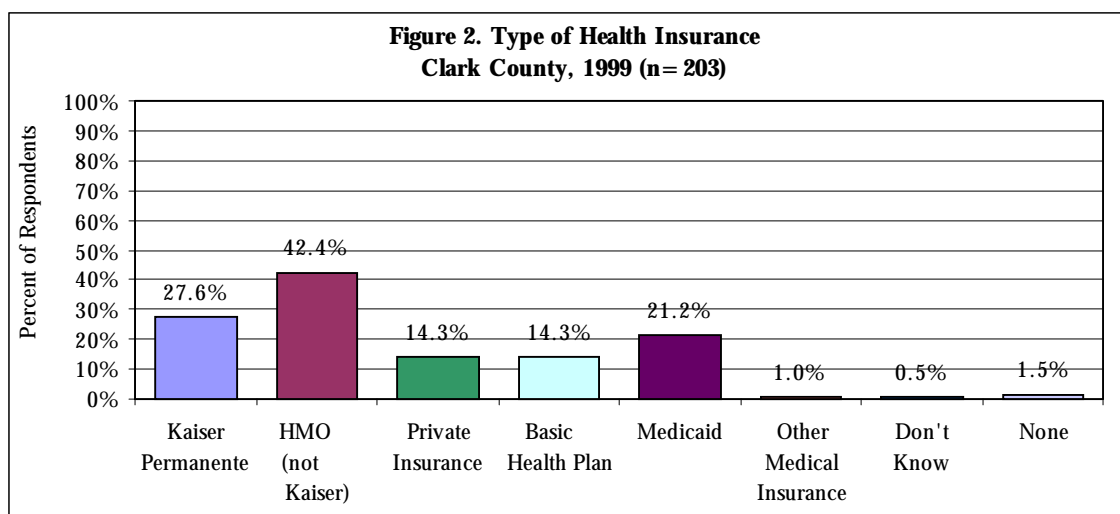
Nearly 99% of respondents reported their child had been given an immunization at some time. Some children received their immunizations in one or more facilities including 76% in a doctor's office, 29% in a Kaiser Permanente facility, 5% in a health department, and 3% in another health care arena (community health clinic, urgent care clinic or military clinic). More than half (55%) of the children received an immunization in a hospital at birth due to recommendations during this time period (Figure 1).

When interviewed about health insurance coverage during the child's first 19 months of life, parents reported that about



70% were covered through a Health Maintenance Organization (27.6% by Kaiser and 42.4% other than Kaiser). Another 14.3% of the children were covered by private health insurance. Just over one-third (35.5%) of the children were covered with State or Federal assistance, 21.2% with Medicaid and 14.3% with the Washington State Basic Health Plan. The remaining children had either some other insurance coverage (1%), had no insurance coverage at all (1.5%), or the parent didn't know if the child was covered (0.5%) (Figure 2). By far the majority of parents stated that their child had a health care provider at birth (91.1%) and currently has a regular health care provider (94.6%).

Of those interviewed, 90.6% said they had been given a shot record from a health care provider, but only 61.6% were able to locate it for the survey. Some parents had recently moved and the records were packed away, some were at the child's day care center, and others were just not able to find them.



Dates Immunizations Were Received

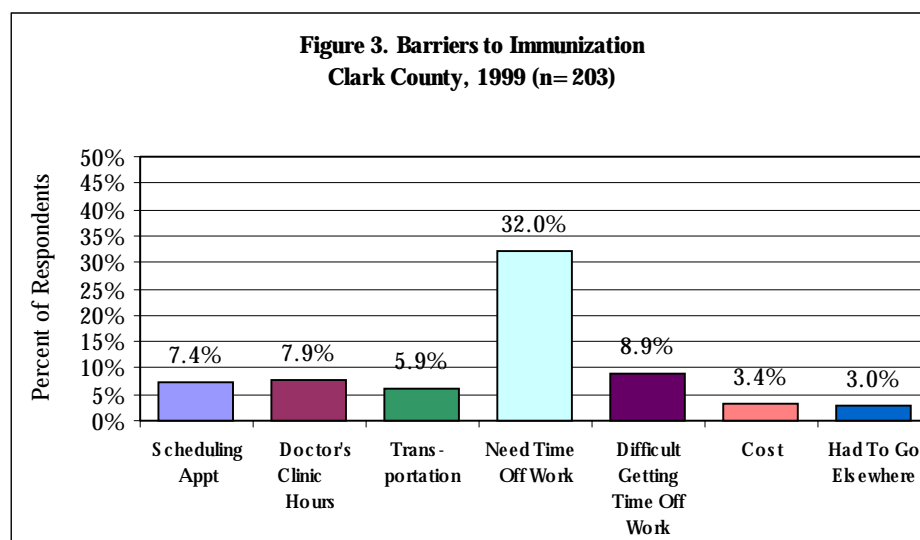
Immunization dates for the vaccines given were collected directly from an immunization record or card provided by the parent or guardian during the interview. Dates were also obtained from the child's health care provider when parent gave consent for immunization records. Children whose health records could not be located or verified with the health care provider were considered not vaccinated. The information acquired from the survey respondents is reported in the section of this report titled Immunization Coverage Results-Parent Information.

Immunization Experiences

Barriers

The survey asked about obstacles or barriers (such as cost, transportation, or inconvenient clinic hours) that had been experienced by the parent in attempting to get immunizations for their child.

These barriers were identified in previous studies as significant in preventing adequate childhood immunizations (West & Kopp, 1999; Kimmel, Madlon-Kay, Burns, & Admire, 1996; Horner & Murphy, 1999). Overall, about half of the respondents (46.7%) reported experiencing barriers when getting their



child's immunizations. The percentage of those surveyed citing a barrier as a problem for receiving immunizations included the following: 8.9% for difficulties getting time off work to take the child to an appointment, 7.9% for inconvenient health care provider or clinic hours, 7.4% for difficulties scheduling appointments, 5.9% for difficulties with transportation, and 3.0% were requested to seek immunizations through another health care provider (Figure 3). Only 3.4% of the parents cited cost as a problem. A fairly large number of people (32%) had to take time off work in order to get their child immunized. No single barrier affected a large number of the 203 parents surveyed.

Awareness

Most parents (89.2%) said they usually knew when immunizations were due for the child; however, many fewer (48.3%) said they kept a copy of the recommended immunization schedule at home. Just under one half (46.8%) reported receiving mail or phone reminders for well child check-ups or immunization appointments.

Missed Opportunities

Of those interviewed, 18.2% did not get an immunization for their child when they expected to get one during a visit to the health care provider. This proportion is consistent with other recent childhood immunization studies conducted by local health jurisdictions in Washington State (McDonald, Lukens-Bull, Knight, Carpenter, & Dom, 1999; Gordon, Coffey, Churchill, Brown, Coward, & Serafin, 1999; Thompson, Bohorques, Palmer Smith, Smith, Olson, Gaut, & Sargent, 2000). A few (3.0%) said their provider had sent them somewhere else for their child's immunizations. Some reasons stated for not getting an immunization included 9.9% (n=20) when their child was thought to be too ill, 2.2% (n=4) because it was too soon for another immunization, 1.0% (n=2) when there was not enough time in the visit, and 3.0% (n=6) stated some other reason. Some responses in the Other category were child had a rash, staff shortage, and child had taken medicine.

Most of the time (72.4%) providers informed parents of recommended immunizations, but 8.9% of parents stated that they had to ask for immunizations and were not informed they were due.

Number of Visits to Health Care Provider

Nearly one half of the children (47.3%) saw their health care provider at least 4 times during their second year of life. Only six children (3.0%) did not see a health care provider at all during their second year.

Day Care

Between birth and 19 months of age, 30.5% of children in the survey regularly attended day care. Five children (2.5%) had been excluded from day care at some point due to lack of immunizations.

WIC and AFDC/TANF

Parents reported that 44.8% of the children were enrolled in Women, Infants, and Children (WIC) at some point between birth and 19 months of age. Similarly, 17.7% were enrolled in Aid to Families with Dependent Children (AFDC) or Temporary Assistance to Needy Families (TANF).

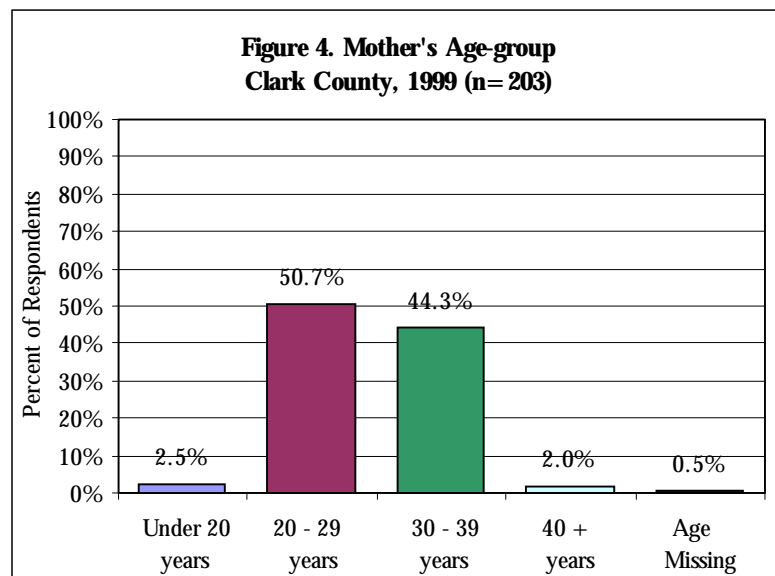
Personal, Philosophical or Religious Objections

Most parents did not object to having their child immunized; however, 8.4% stated they did have a personal, philosophical or religious reasons why some immunizations should not be given to their child. This finding is consistent with other recent childhood immunization studies conducted by local health jurisdictions in Washington State (McDonald, Lukens-Bull, Knight, Carpenter, & Dorn, 1999; Gordon, Coffey, Churchill, Brown, Coward, & Serafin, 1999; Thompson, Bohorques, Palmer Smith, Smith, Olson, Gaut, & Sargent, 2000). Sixteen comments were noted concerning personal objections or concerns about immunizations. Six comments were regarding varicella, one MMR, and others were general concerns about child safety, benefits of having shots, and research about vaccine effectiveness.

Respondent Demographic Information

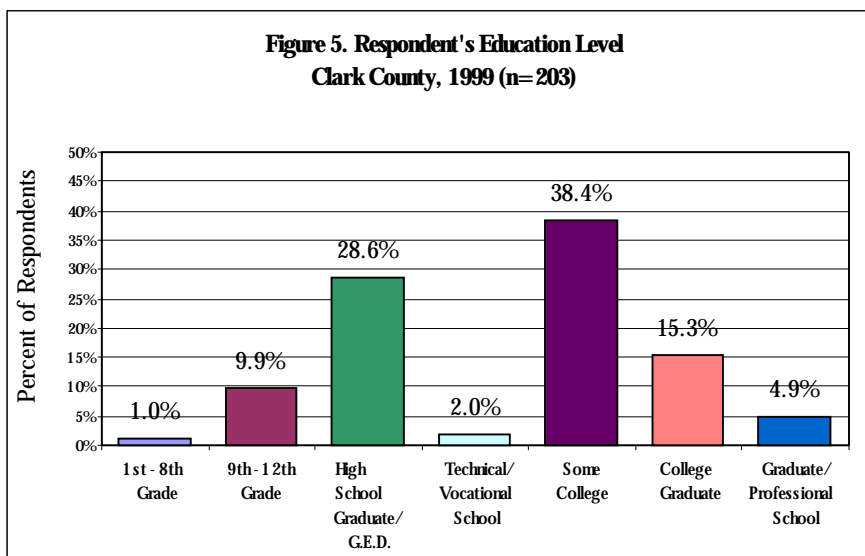
Age of Mother

An overwhelming number of survey respondents were mothers (93%) of the subject children. The average age of mothers was 30 years, ranging from 19 to 46 years of age. The most frequent age was 26 years of age. The majority of mothers were between 20 and 39 years of age (Figure 4). At the time of the interview, a small number of mothers were either under 20 years of age (2.5%) or over 40 years of age (2.0%).



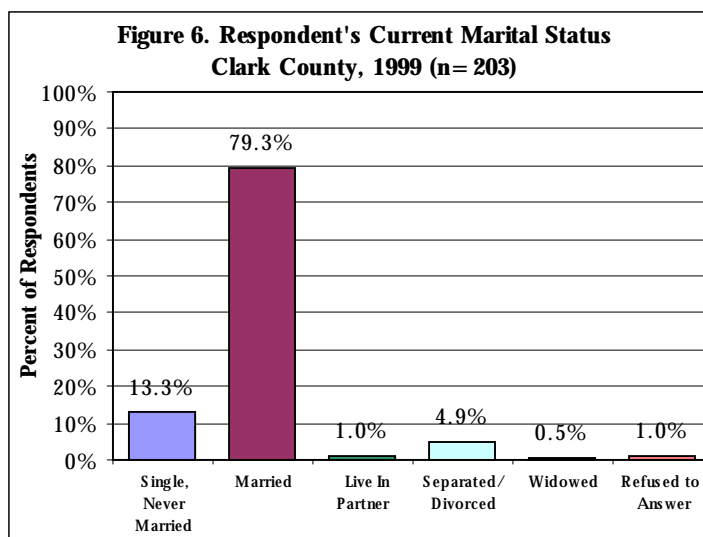
Education

More than half of respondents (58.6%) had attended or graduated from college (Figure 5). There were nearly one third (30.6%) of respondents who graduated from high school, completed a graduate equivalence degree program, or had attended vocational or technical school but had not attended further schooling. A small portion of the parents (10.9%) reported not graduating from high school.



Marital Status

Most parents were married (79.3%) at the time of the survey (Figure 6). Other respondents were currently single who had never married (13.3%), separated or divorced (4.9%), had a live-in partner (1.0%), or were widowed (0.5%). A few refused to answer this question (1.0%).



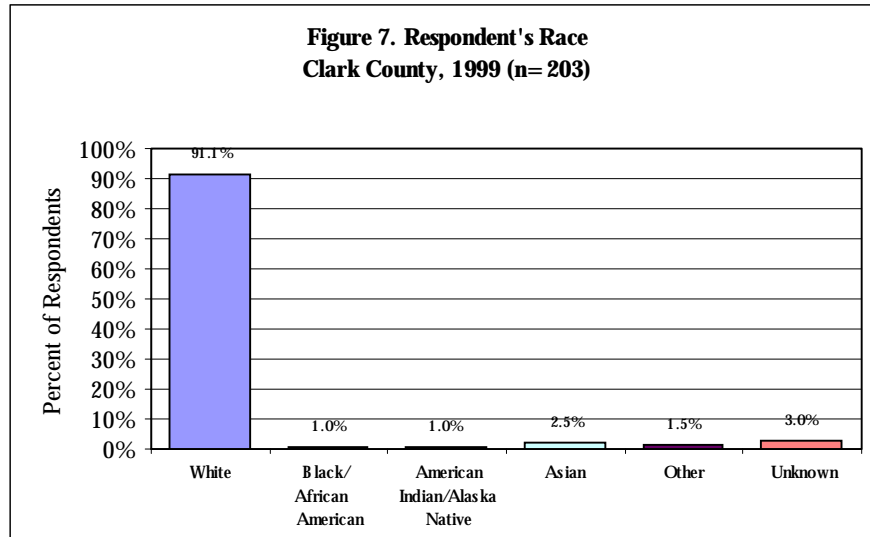
Employment

Before the child was 1 1/2 years old, 46.8% of respondents were not employed, 47.7% were employed part-time or full-time, and 3.9% indicated they were self-employed. These figures refer only to the respondent and do not incorporate other household members.

Race and Ethnicity

Most respondents completing the survey reported that they were White/Caucasian (91.1%) (Figure 7). Some respondents reported being Asian Indian, Chinese, and Filipino in the Asian category (2.5%). The 3.0% of respondent's who did not report their race are included in the Unknown category. Also, several respondents reported they were of Hispanic origin (9.3%) (not shown).

In most cases the primary language spoken in the home of the respondents was English (92.6%) followed by Russian (2%) and several other languages. Translated surveys and interpreters for Spanish, Russian, and Vietnamese speaking respondents were available for the project.

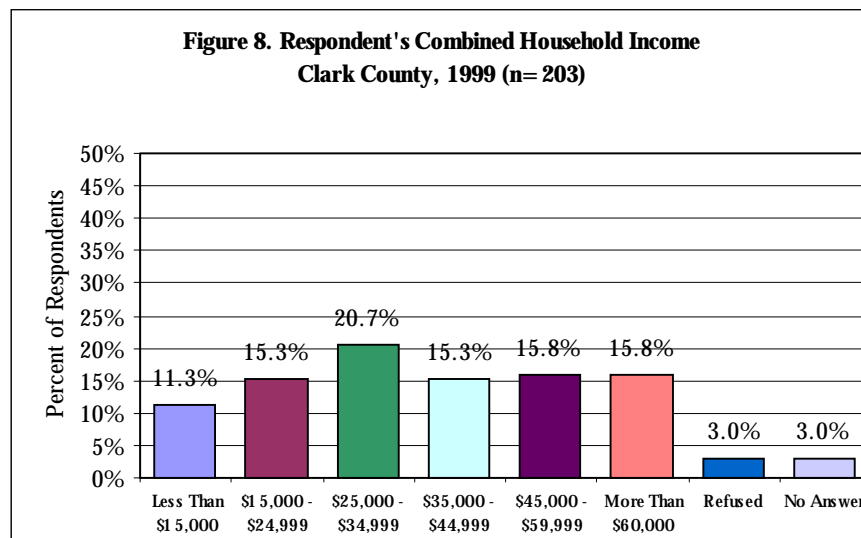


Persons in Household

The average number of individuals living in a household was 4.2. The number of persons living in the household ranged from two to 10. Eight respondents (3.9%) did not answer this question.

Income

Slightly more than one half (51.3%) reported an annual combined family household income of between \$15,000 and \$45,000 during the child's first year of life (Figure 8). Several respondents (11.3%) reported a household income of less than \$15,000 per year. Nearly one third of respondents (31.6%) reported an income of \$45,000 or more. A portion of the sample (15.8%) reported a household income of greater than \$60,000 per year. A small number of respondents refused to answer this question (3.0%) or did not answer (3.0%).



Immunization Coverage Results

Immunization coverage includes information received from 1) parents, 2) health care providers, and 3) combined sources. There is a further discussion of these sources in each of the following sections. In the first two sections, information provided by the parent and health care provider will be discussed. The third section presents combined immunization information in a more detail fashion. The immunization schedule used for the study was the recommended 4:3:1 (4 DTP, 3 Polio and 1 MMR), 4:3:3:1 (4 DTP, 3 Polio, 3 Hib and 1 MMR) and the 4:3:3:1:3 (4DTP, 3 Polio, 3 Hib, 1 MMR and 3 Hepatitis B) series (CDC, MMWR 45(29), 1996) (Table 4). Haemophilus influenza type b conjugate vaccine, or Hib, is reviewed in the 4:3:3:1 immunization series, and the Hepatitis B vaccine is reviewed in the 4:3:3:1:3 immunization series. Most of the results reported focus on the 4:3:1 series only.

Single antigen coverage was also reviewed. An antigen refers to a type of vaccine given to stimulate the production of antibodies against a specific disease (e.g., Polio) or diseases (e.g., MMR or measles, mumps and rubella). Single antigen coverage refers to when an individual received the completed recommended immunization series for each specific disease. For example, full single antigen coverage of Polio for a 35-month-old child would be a series of three Polio immunizations.

The analysis investigated whether the child had all of the recommended immunizations (full), had at least one of the recommended immunizations but not all of them (some), or had received none of the recommended immunizations or there was no record available of the immunizations received (no). The following graphs and text will refer to immunization coverage as full, some, or no coverage.

Table 4. Composition of Recommended Immunization Series					
Series	4 DTP	3 Polio	3 Hib	1 MMR	Hep B
4:3:1	X	X	---	X	
4:3:3:1	X	X	X	X	
4:3:3:1:3	X	X	X	X	X

Parent Information

Parent Individual Antigen Information

There were 119 survey participants who provided immunization information during the interview. Participants were asked to read from their immunization records the dates that

immunizations were administered to their child. Figure 9 shows single antigen coverage as reported by the source (parent, provider, and combined information).

Parent Up-to-Date Series Information

Nearly one half of the surveyed parents (44%) reported that their child was up-to-date for the 4:3:1 immunization series. This response is derived from parents who had shot records readily available during the interview. It does not include parents who stated their children was immunized if they could not produce the shot record. Parents also reported that 44% of their child were up-to-date for the 4:3:3:1 immunization series. Figure 10 shows series coverage as reported by the source (parent, provider, and combined information).

Health Care Provider Information

Provider Individual Antigen Information

One hundred and thirty five health care providers responded to the request for immunization dates for the sample children. Figure 9 shows single antigen coverage as reported by the source (parent, provider, and combined information).

Provider Up-to-Date Series Information

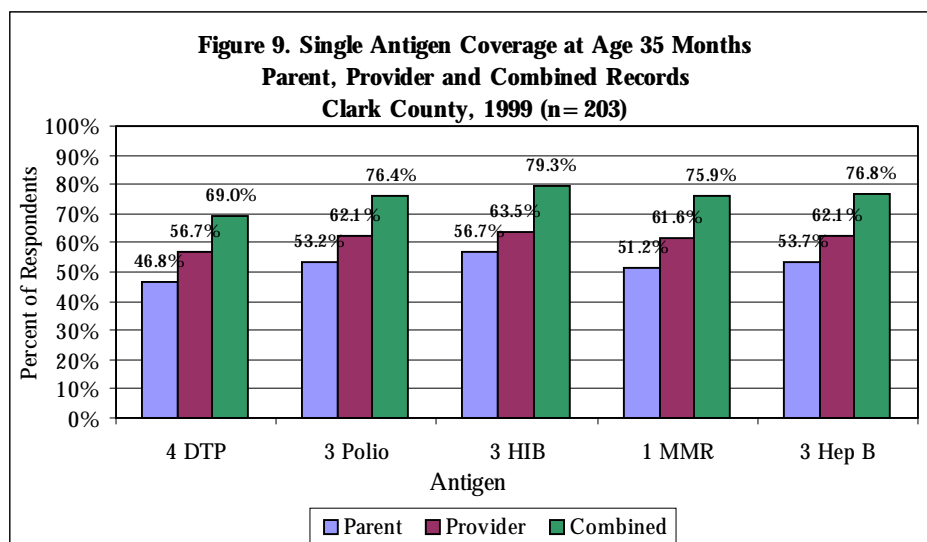
Based on provider records, 54% of the surveyed children were found to be up-to-date for both the 4:3:1 and 4:3:3:1 immunization series. Figure 10 shows series coverage as reported by the source (parent, provider, and combined information).

Combined Parent and Provider Information

For all subsequent analyses, all available immunization information from parents and health care providers was combined to provide a more complete picture of the child's immunization history.

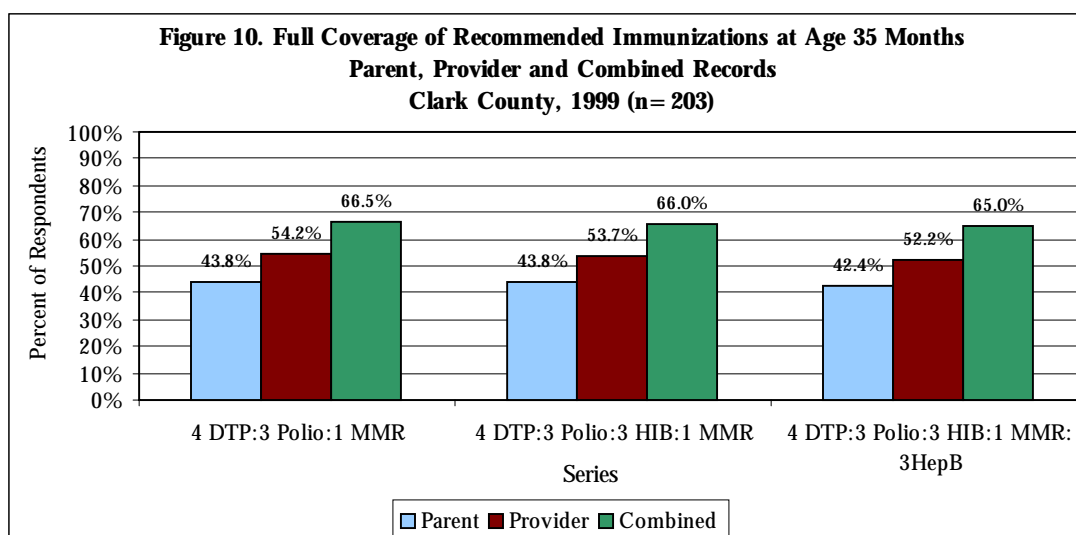
Combined Individual Antigen Information

For single antigen series coverage from combined sources, the 3 Hib series had the highest rate for full coverage at 79.3% (Figure 9). The 4 DTP series had the lowest rate at 69.0%. For other single antigen series, the coverage was 76.8% for 3 Hep B, 76.4% for 3 Polio, and 75.9% for 1 MMR. The following chart shows single antigen coverage as reported by parent, provider, and combined records.



Combined Up-to-Date Series Information

The project found that with parent and provider information combined, 67% (59.7 –79.7 95% CI) of Clark County children were fully vaccinated for the 4:3:1 series by 35 months of age (Figure 10). For the 4:3:3:1 series, the current coverage rate was 66%. When considering Hepatitis B coverage for the 4:3:3:1:3 immunization series, 65% of children were fully vaccinated. When looking at coverage with only parent or provider information, the percent of fully vaccinated children dropped about 10% with only health care provider records (to about 53%) and an additional 10% with only parent records (to about 43%). Figure 10 shows immunization series covered as reported by parent, provider and combined information.

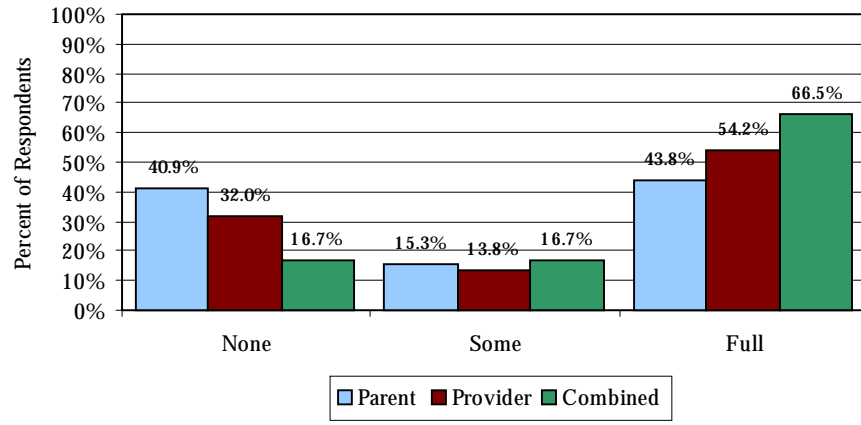


For the 4:3:1 immunization series, combined parent and provider records produced a more accurate view of immunization status. While only 43.8% of children were considered fully immunized according to parent records, 54.2% were fully immunized according to provider

records, and 66.5% for combined records (Figure 11). There were a large number of parents who did not have a record of their child's immunization dates.

Most participants either had information from parent record, provider record or both. For clarification, there were no immunization date history data available for 17% (n=34) of survey participants. These children were counted as having no immunizations which underestimates the number of children with full immunization coverage and overestimates the children with less than full coverage. There were only a couple of children whose parents reported having never given the child any immunizations (n=3).

**Figure 11. Immunization Coverage Level (4:3:1) at Age 35 Months
Parent, Provider and Combined Records
Clark County, 1999 (n= 203)**

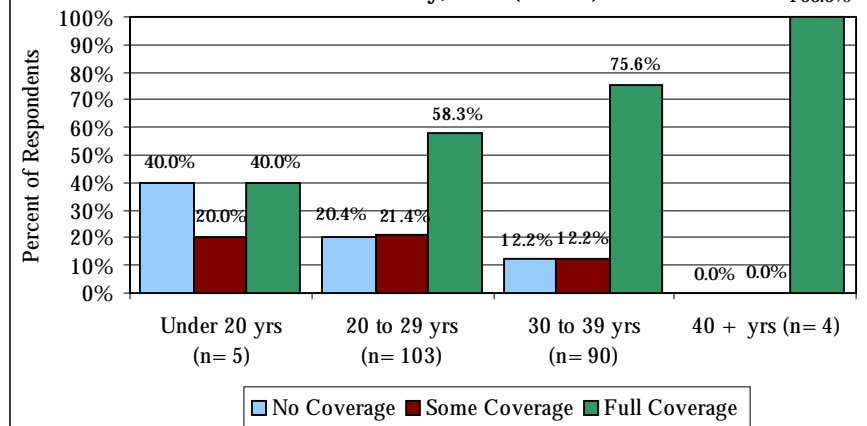


Of the 34 children that had some, but not full, coverage in the 4:3:1 immunization series at 35 months, 23 children were only one visit short of receiving all recommended immunizations. If these 23 children had been fully immunized, the county rate would have been 78%.

Age of Mother

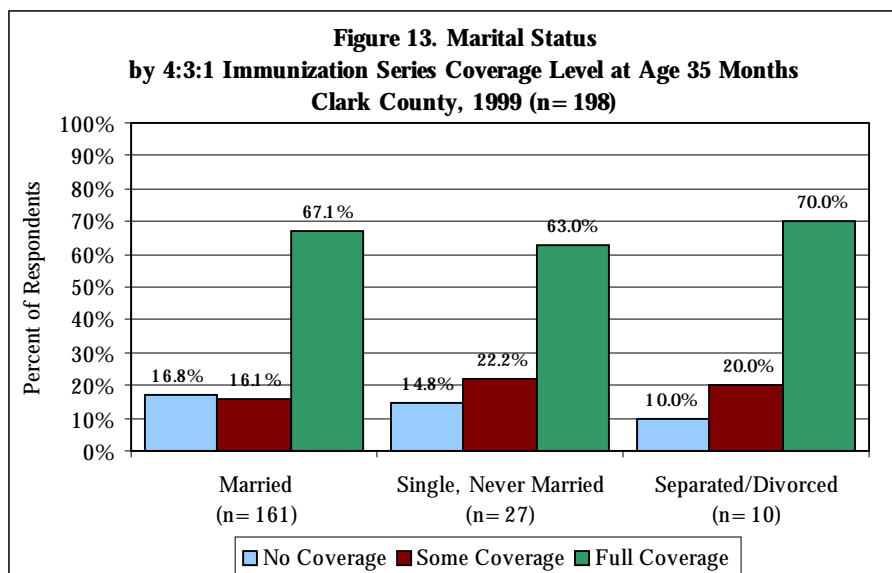
Data on the age of mothers and the rate of immunization series coverage were crosstabulated (Figure 12). As the age of mothers increased so did the proportion of children who were fully immunized ranging from 40% of children when the mother was under 20 years old to 100% when the mother was 40 years old or more. Therefore, the younger the parent was the less likely the child was fully immunized. Also, the mothers under 20 years old were less likely to produce information on the dates of their child's immunizations.

**Figure 12. Mother's Age-group
by 4:3:1 Immunization Series Coverage Level at Age 35 Months
Clark County, 1999 (n= 202)**



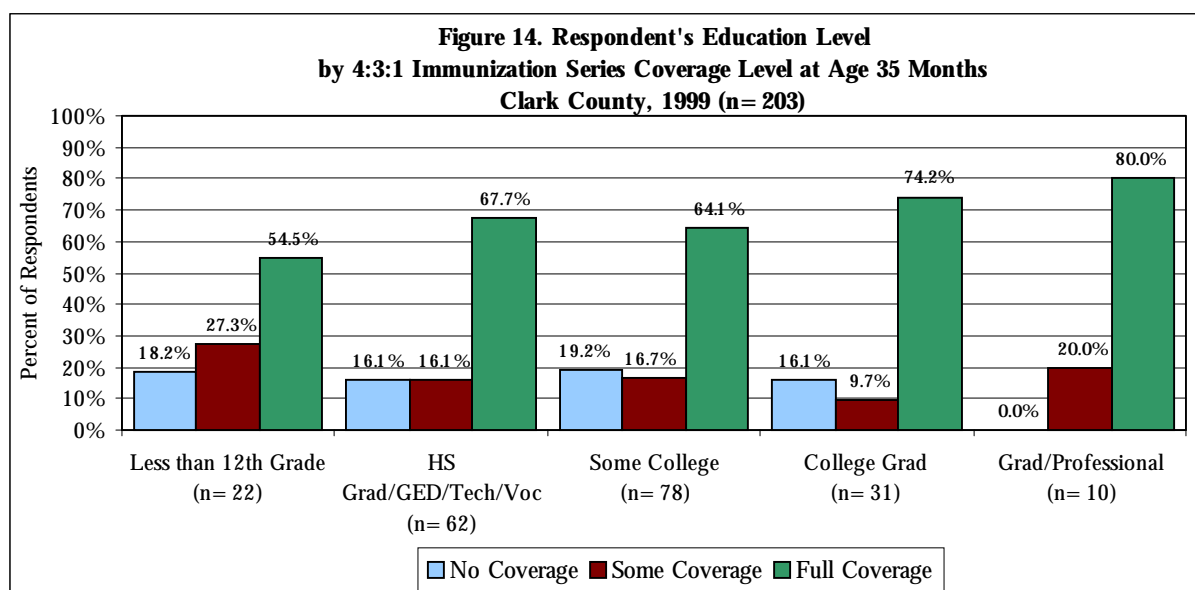
Marital Status

By far, the majority of the parents who responded were currently married at the time of the survey (81%) (Figure 13). There was not much difference in the proportion of fully immunized children when reviewing immunization status when parent was married (67.1%), single (63%), or separated/divorced (70.0%).



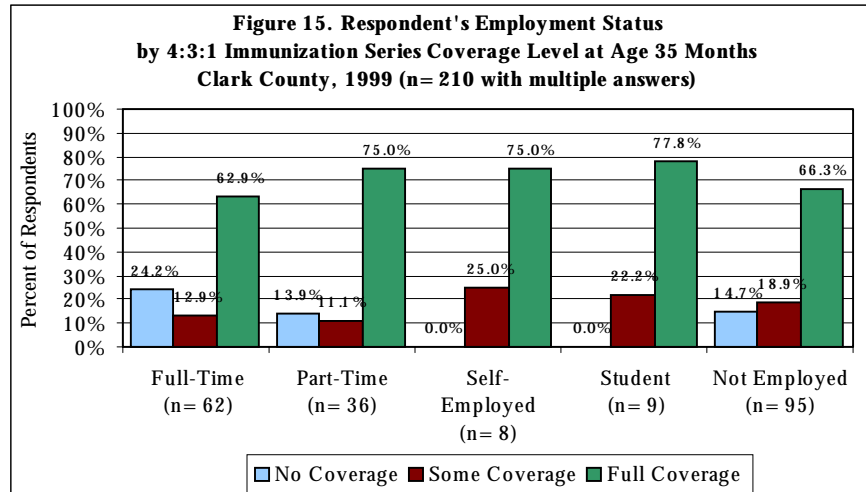
Education Level

In general, immunization coverage is more complete as parent education level increases (Figure 14). Parents responding to the survey interview that had graduated from college or had attended graduate or professional school had the largest percentage of fully vaccinated children, 74.2% and 80.0% respectively. Those respondents who had graduated from high school, completed a graduate equivalency degree (GED), attended technical or vocational school (n=62), or had some college education (n=78) were similar in their children's full immunization coverage, 67.7% and 64.1% respectively. Respondents with less than a 12th grade education (n=22) had the lowest immunization rate of 54.4%; however, this low rate of full immunization coverage was not statistically significantly different than the rate when the respondent had a high school degree or further education (Table 5). Also, there were no statically significant differences between college graduates and those who had less than a college education.



Employment

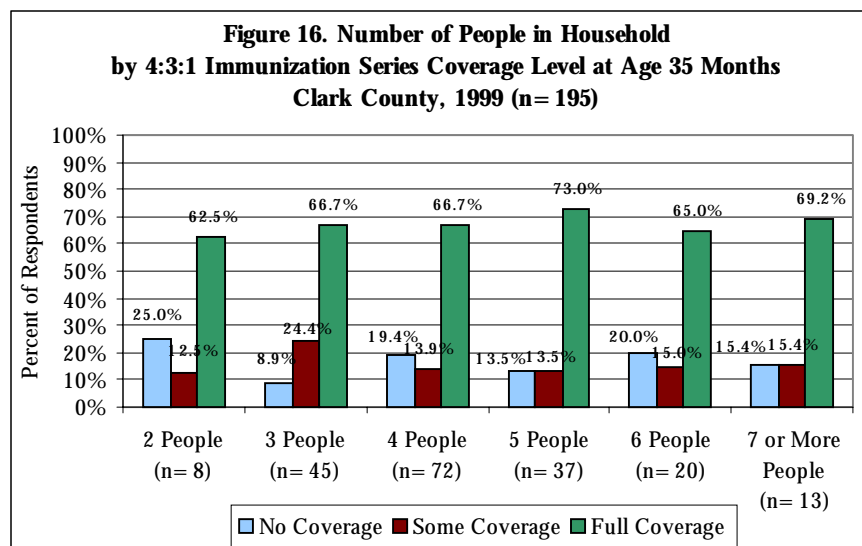
Almost one half of respondents (46.8%) were not employed during the child's first year and a half of life (Figure 15). For these parents, 66.3% of their children were fully immunized. Respondents that worked full-time (n=62) had the lowest proportion of children who were fully immunized (62.9%). Respondents who worked part-time, were self-employed, or were students had the highest rates of full immunization coverage among their children, 75.0%, 75.0%, and 77.8% respectively. When the categories of full-time employment, part-time employment, and not employed were each crosstabulated against full immunization coverage, no statistically significant differences were found (Table 5).



There were 62 (30.5%) children who attended daycare during their first 19 months of life. There was no statistically significant difference for fully immunization coverage between these children and those who did not attend daycare (Table 5).

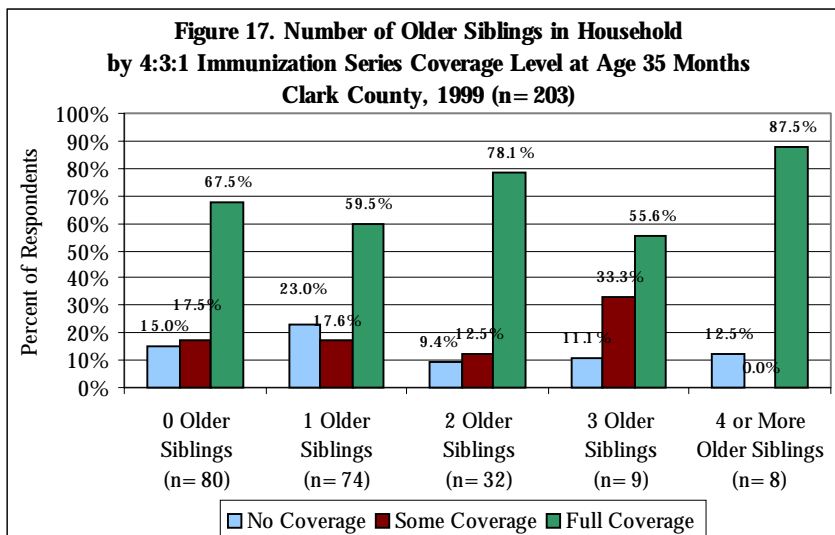
Number of Persons Living in Household

Three fourths of families (75.9%) had three, four, or five people in the household (n=154) (Figure 16). The full immunization coverage varied by number of people in the household and ranged from 62.5% when 2 people were present to 73.0% when there were five people in the household. Chi square test results found no statistically significant difference between having 4 or fewer or having 5 of more people in the household (Table 5). There was no indication whether the number of persons in the household represented parents and children, grandparents, or other persons in the household.

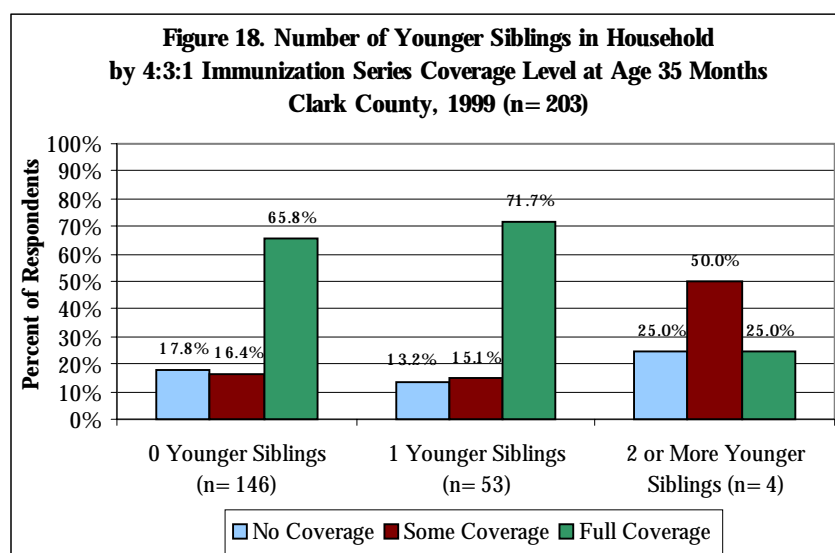


Number of Siblings

The number of older siblings in the household ranged from none to four or more (Figure 17). Full immunization coverage was the highest when there were 4 or more older siblings (87.5%), and the lowest rate was among children with 3 older siblings (55.6%). In households with no older siblings, the full immunization rate was 67.5%. This rate was not statistically significant from households that had older siblings (Table 5). In households with only one sibling, the rate was 59.5% and with 2 older siblings was 78.1%. There was also no statistically significant difference between 1 or fewer and 2 or more older siblings.



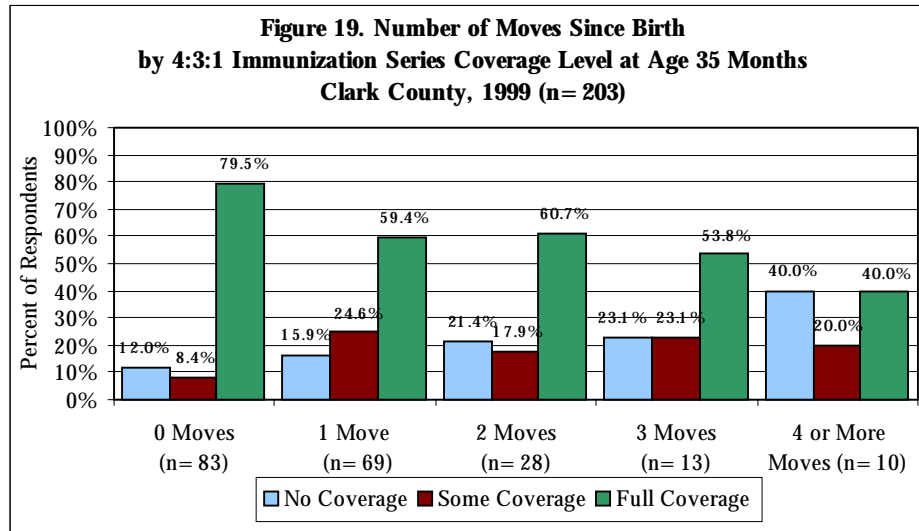
Because the children studied were very young, only 57 had younger siblings in the household (Figure 18). Children with one younger sibling in the household (n=53) were more likely than children with 2 or more younger siblings (n=4) to be fully immunized, 71.7% compared to 25.0%. Most children had no younger siblings in the household (n=146). These children had a fully immunized coverage rate of 65.8%. There was no statistically significant difference between children who had younger siblings and those who did not (Table 5).



Number of Moves since Birth

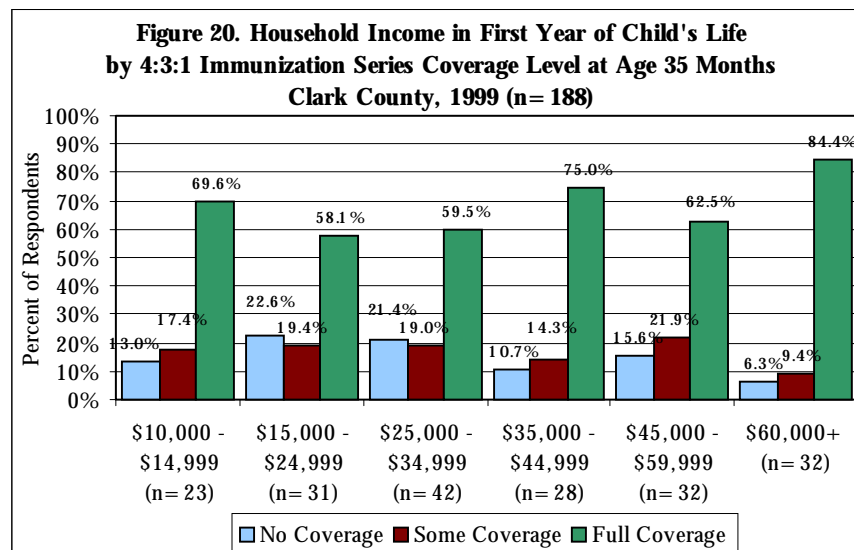
There were many children who had not moved since their birth (41%); however, there were nearly 60% of children who had moved at least once since birth. When data from number of moves since birth were cross-tabulated with the child's immunization status, the more moves a

child experienced, the less likely the child was to be fully immunized (Figure 19). There were 79.5% of children who had not moved that were fully immunized (n=83). The immunization rate dropped to 59.4% for children with one move (n=69) and then steadily declined to 40% for children with 4 or more moves (n=10). Statistically significant differences were found between the immunization rate children who moved several times and those who did not. When children had moved only once or not at all, they were more likely to be fully immunized ($p=.033$), and when children had not moved at all since birth, they were much more likely to be fully immunized ($p=.001$) (Table 5).



Household Income

Children were fairly evenly distributed among household income categories (Figure 20). The families with an income of \$60,000 or more (n=32) had the highest percentage of children that were fully immunized (84.4%). The lowest fully immunization coverage rate was 58.1% among families with \$15,000-\$24,999 (n=31). In the lowest income category of \$10,000-\$14,999, 69.6% of the children were fully immunized. Except in households with an income of \$60,000 or more during the child's first year of life, income did not show to be a factor in having a child fully immunized ($p=.013$) (Table 5). There was no statistically significant difference between a household income of \$45,000 or more compared to income of lower than \$45,000. There were 12 respondents who did not answer this question.



WIC or AFDC/TANF Recipient

Families enrolled in WIC were about as likely as families who were not enrolled in WIC to have their child fully immunized (Figure 21). Of the 91 children enrolled in WIC, 65.9% were fully immunized compared to 67.6% of children who were not enrolled in WIC.

There were fewer children who received AFDC/TANF assistance than children who received WIC. Overall, there were fewer children who received AFDC/TANF assistance during their first year of life (n=36) than those who did not (n=162) (Figure 22). Children who received assistance had a rate of full immunization of 58.3% compared to those who did not receive assistance (67.9%).

Insurance Coverage

In order to describe what health insurance coverage children had, the survey questionnaire asked parents the following question: "Between birth and 19 months of age that's the first year-and-a-half of life, what type of medical

insurance did (Child's name) have?" The answer choices were Kaiser, HMO/Managed Care (other than Kaiser), Private Insurance, State Basic Health Plan, Healthy Options/Medical Coupons, or Other. The respondent was allowed to choose all the answer choices that applied to their child during that time. Full immunization coverage was similar among insurance categories including 74.4% Healthy Options/Medical Coupons, 71.4% Kaiser, 65.1% HMO (other than Kaiser), 62.1% Basic Health Plan, 62.1% Private Insurance. Nearly 70% of the children were covered by either Kaiser or another HMO (n=142) (Figure 23).

Figure 21. Child Enrolled in WIC by 4:3:1 Immunization Series Coverage Level at Age 35 Months Clark County, 1999 (n= 202)

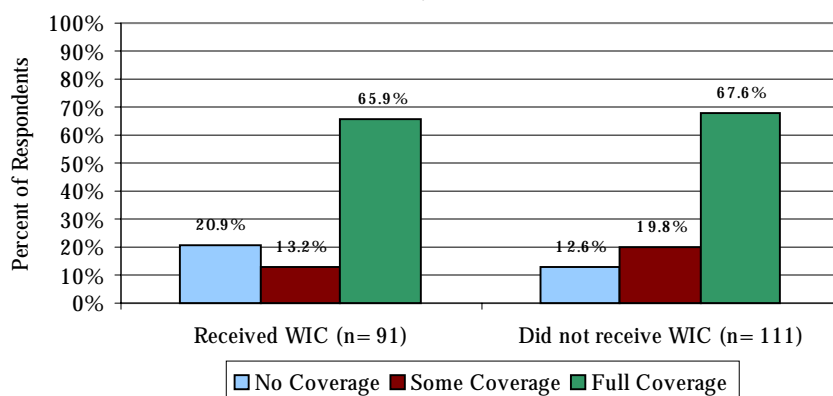
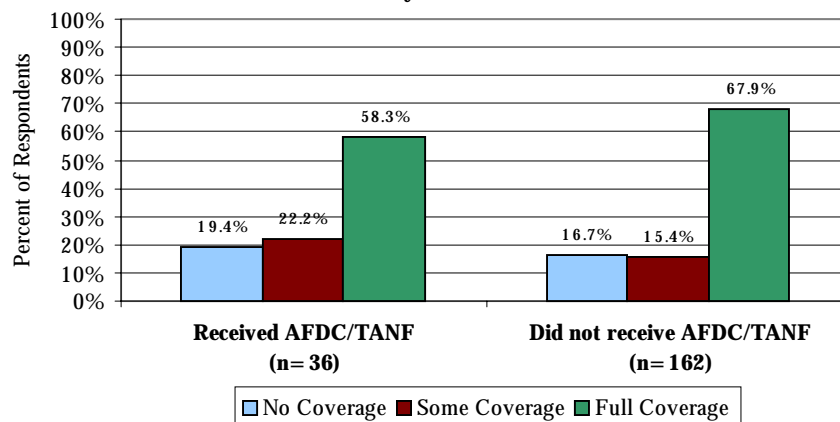
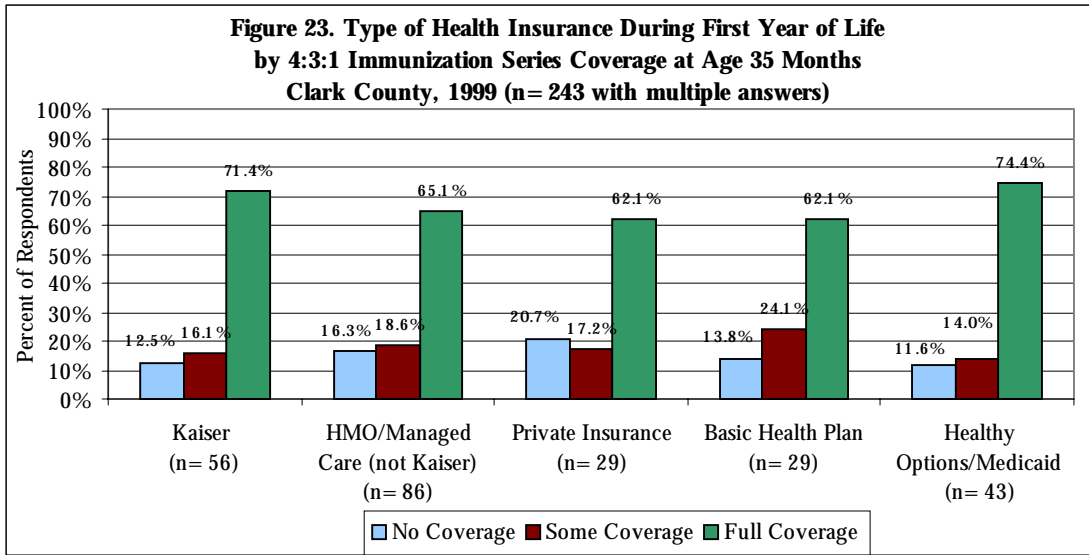


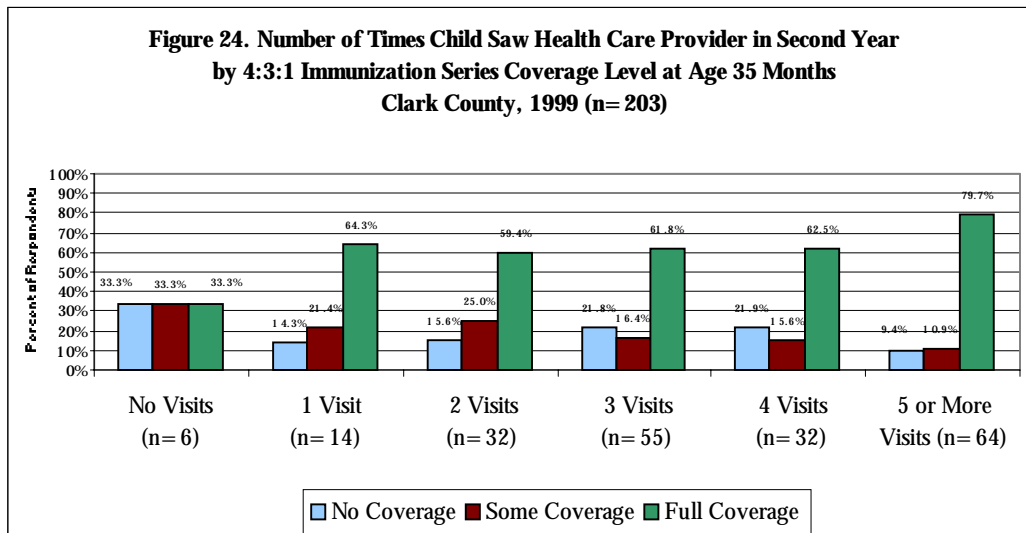
Figure 22. Child Enrolled in AFDC/TANF by 4:3:1 Immunization Series Coverage Level at Age 35 Months Clark County, 1999 (n= 198)





Number of Visits to a Health Care Provider during Second Year of Life

There were very few children who did not see a health care provider during their second year of life (n=6) (Figure 24). Only 2 of those children were fully immunized (33.3%). For the other categories, the full immunization rate ranged from 59.4% for children with 2 visits (n=32) to 79.7% for children with five or more visits (n=64). Children that had four and five or more visits (n=96) to a health care provider combined during their second year of life were more likely to be fully immunized (73.9%) (p=.023) (Table 5).



Barriers to Obtaining Immunizations

The three areas considered barriers to obtaining childhood immunizations that were analyzed included clinic accessibility, transportation, and cost. Overall, just under half (46.7%) of respondents (n=95) reported having at least one barrier when having their child immunized (Figure 25). However, there was no single barrier that indicated it was of major concern. When

crosstabulating whether the respondent had experienced barriers or not when getting their child immunized with the full immunization status of the child, there was no statistically significant difference in full coverage between the groups (Table 5).

Clinic Accessibility. - People who reported trouble with scheduling an appointment or problems with health care provider of office hours were less likely to have their child fully immunized. Fifteen families reported trouble scheduling an appointment and 16 families reported trouble because of health care provider hours. Of both these groups about half of these children (51.6%) were fully immunized compared to a group rate of 69.5% for those not reporting these barriers.

Also consider a barrier was if the parent needed to take time off of work. Sixty-five (32.0%) reported that they needed to take time off of work to get their child immunized. Of the sixty-five, 18 (27.7%) reported that it was difficult to get this time off of work. Despite having to take time off of work and working with the difficulties of getting the time off, 70.7% and 72.2% respectively were able to get their child fully immunized.

Transportation. - Twelve families reported transportation as a barrier for getting their child immunized. Of the twelve, only five (41.7%) were fully immunized while the rate for those not reporting this barrier was 69.5%.

Cost. - Most people (97%) said cost was not a barrier to getting their child immunized. Seven (3%) said it was a barrier and of those seven, 3 were fully immunized (42.9%).

Another identified barrier in the literature is the parent and health care providers detailed knowledge of a child's immunization status (e.g., dates). Around

60% (61.5%) of parents could produce a record of their child's immunization dates. Chi square test for significance found that these children were much more likely to be fully immunized ($p < .0005$) (Table 5). Other related factors included having a copy of the appropriate immunization schedule at home and knowing when it is time for the child's immunizations. Neither of these factors were found to be statistically significant.

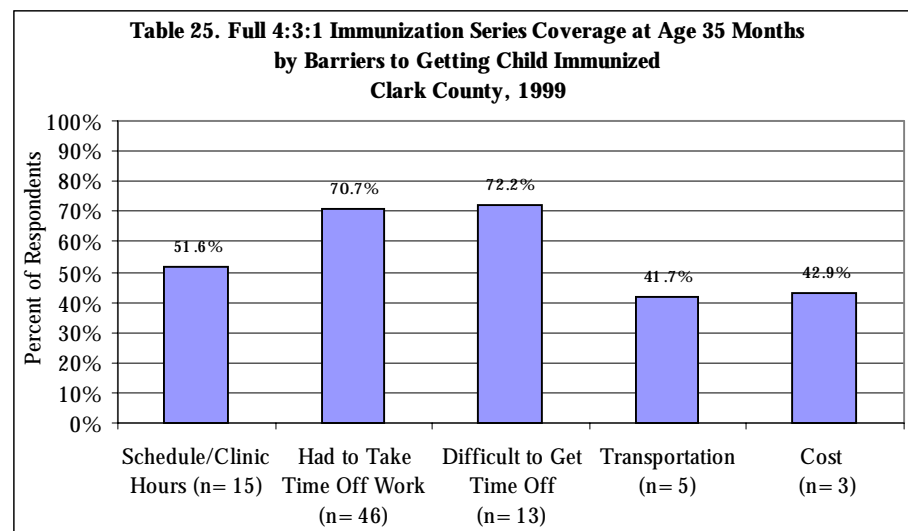


Table 5. Comparison of different factors and their relation to full 4:3:1 immunization coverage

	Characteristic	Number	Percent	P value
Barriers to getting child's immunizations:	No barriers when getting child immunized	77	71%	P=.082
	vs. had barriers	58	61%	
Day care attendance:	Attended daycare	44	71%	P=.223
	vs. did not attend daycare	90	64%	
Educational attainment:	Respondent had High School degree	123	68%	P=.154
	vs. less than High School degree	12	55%	
	Respondent had College degree	31	76%	P=.114
	vs. less than College degree	104	64%	
Employment:	Full-time employment	39	63%	P=.287
	vs. not full-time employment	96	68%	
	Part-time employment	26	74%	P=.192
	vs. not part-time employment	109	65%	
	Not employed	63	66%	P=.538
	vs. employed or student	72	67%	
Household income:	Income of \$45,000 or more	47	73%	P=.099
	vs. lower income	80	63%	
	Income of \$60,000 or more	27	84%	P=.013*
	vs. lower income	100	63%	
Health care provider visits:	4 or more health care provider visits in second year	71	74%	P=.023*
	vs. fewer visits	64	60%	
Number of moves since birth:	One move or not at all	107	70%	P=.033*
	vs. more than one move	28	55%	
	Never moved	66	76%	P=.001**
	vs. moved once or more	69	58%	
Number of people in household:	4 or fewer people in household	83	66%	P=.363
	vs. 5 or more people	49	70%	
Records of immunizations:	Had immunization record	102	82%	P<.0005**
	vs. did not	23	40%	
	Had copy of recommended immunization at home	71	72%	P=.066
	vs. did not	62	62%	
	Knew when child's immunizations were due	121	67%	P=.431
	vs. did not	13	72%	
Presence of siblings:	Younger siblings in household	39	69%	P=.425
	vs. no younger siblings	96	66%	
	Older siblings in household	81	66%	P=.465
	vs. no older siblings	54	67%	
	*Statistically significant at p≤.05 **Highly statistically significant at p≤.01			

Discussion of Results

The previous Clark County immunization study done in 1994 was useful for determining a baseline rate of childhood immunizations. The current study sought to identify a more recent childhood immunization rate and experiences for Clark County children. There were methodological differences between the two studies; however, they were each considered the best available methods at the time. The 1994 study used cluster sampling methodology. The current study used a birth certificate follow back methodology that has been done in several other counties in Washington State in recent years and the data are more representative of the county's experience.

The method of contacting parents by telephone worked well, but it was necessary to have the other methods of contact available to reach even more families. The multi-staged approach required many resources both in time and personnel. The children still living in Clark County were well dispersed geographically around the county. We were also able to contact families outside of the county including others in Washington State, Oregon, California, and several other states.

The demographic characteristics of the survey respondents was comparable to the general population of Clark County in many respects. In 1997, the Clark County population was 94% white, and the study found that 91% of respondents were white. Clark County has experienced a tremendous amount of in-migration since the early 1990s. There were 86% of the subject families that still lived in Clark County, and only a small number who had relocated outside of Clark County. As with the general population, about one half of the study subjects were female and half were male. Overall, there were no apparent statistically significant differences between survey respondents and nonrespondents based on maternal and paternal demographic characteristics at the time of birth. These characteristics included: gender, plurality of birth, maternal age category, paternal age category, race of mother, race of father, maternal education, paternal education, mother's marital status, mother of Hispanic origin, father of Hispanic origin, mother enrolled in WIC, and mother enrolled in AFDC or TANF.

The childhood immunization rate for Clark County children between 19 and 35 months of age for the 4:3:1 series (4 DIP, 3 Polio, 1 MMR) was 67%. There were 34 additional children who had received some of the recommended immunizations (e.g., at least one single immunization) but not all of them by 35 months of age. Of the 34 children who did not have all of their immunizations, 23 were lacking only one additional health care provider visit to complete the recommended series. If these children had received all of their immunizations by 35 months of age, the full immunization rate would have risen 11% from 67% to 78%. There were another 34 children who did not have an immunization history available. Parents reported that most of these children had received immunizations; however, their records were unavailable for review and verification. Only a few of these children were never given any immunizations due to parent's beliefs or exemptions.

Most children had health insurance (98%) and a regular health care provider (95%). Most of these children had an HMO/managed care type of insurance and had received immunizations through their provider(s) that accepted these insurance plans. About half of the respondents reported experiencing barriers to getting their child's immunizations; however, no single barrier was outstanding. The most frequent barrier was having to get time off of work, and 9% stated it was difficult getting the time off of work. Cost was not seen as a barrier for most parents.

The likelihood of the child being fully immunized between 19 and 35 months of age increased with these characteristics of the parent(s):

- mother between 20-39 years of age
- married
- high school graduate or more education
- mothers (parent) not employed during child's first year and a half
- had moved once or not at all since birth
- household income during child's first year was greater than \$60,000
- four or more health care provider visits during second year of life
- had a copy of the child's immunization dates available

The survey results were very surprising given the efforts regarding childhood immunizations within the community in recent years. Young children in Clark County should be better protected against vaccine-preventable diseases given the wide availability of low cost vaccines. Attention will now turn towards developing sustained and targeted efforts to see that children are fully and appropriately immunized.

Some identified barriers to childhood immunizations include lack of access and missed opportunities by health care workers to identify underimmunized children. Kimmel, Madlon-Kay, Burns, & Admire (1996) state that health care providers can educate parents about the importance of vaccines and the hazards of the diseases they prevent. Education can reduce these barriers (Glanz, Lewis, & Rimer, 1997).

All Kids Count (2000) state the following four challenges to maintaining and increasing childhood immunization levels: complex vaccine schedule, societal changes (e.g., mobility of families), lack of accurate and complete information by both parent and health care providers, and decreased awareness of the seriousness of vaccine-preventable diseases. Additionally, there are increased concerns about the risk of childhood vaccines. All Kids Count (2000) report the following: "So rare are the cases of measles, mumps, rubella, diphtheria, and tetanus, that a parent of an infant or toddler is more likely to hear about a reported rare adverse reaction to a vaccination than to hear about a child who actually has the disease."

Vaccines are available from Washington State DOH to health care providers at no cost through the statewide Vaccine Distribution Program. This program has helped move vaccines from immunization clinics at local health departments to local health care provider offices. In the last 5 years, the proportion of all vaccines, not only those for children, administered through SWWHD has decreased from approximately 22% to 9%. The result is that only 5% of children

surveyed had received immunizations at SWWHD immunization clinics. The major role of SWWHD now is for the Vaccine Distribution nurse to distribute vaccines, educate community health care providers on recommended and appropriate administration of vaccines, and assist these offices in assessing the childhood immunization rates within their offices.

It is difficult to compare national and local immunization surveys due to dissimilar research methods. A CDC national immunization study utilized a random digit dial survey to determine estimates of immunization coverage for children 19–35 months of age for selected areas (CDC, MMWR 46(29), 1997; CDC, MMWR 47(26), 1998). The national coverage for the 4:3:1 series in 1997 was 78%, and the Washington State coverage rate in 1997 was 80%. In 1999 the Washington State rate was 77% (CDC, MMWR 49(26), 2000).

Informing the community of the inadequate immunization status of children will hopefully be a cue-to action to lower the threat and susceptibility of diseases to the children in the community.

Limitations

There were limitations with the birth certificate follow back methodology. Families change residences and that made it harder to locate them nearly two to three years after the subject child's birth. The study included some children who did not live in Clark County and excluded other children who did currently live in Clark County. Many people have become very reluctant to participate in telephone surveys because of confidentiality, authenticity, and other telephone surveys or inquiries. As with other surveys, information collected was self-reported by the parent except for dates that were verified through the child's health care provider when possible. This type of study required many internal and external resources and took several months to complete data collection and several additional months to analyze and report the results.

Plan for Future Dissemination

Presentation to Board of Health

The major results and information about the 1999 Clark County Childhood Immunization Project was presented to the SWWHD Board of Health in June 2000. Findings were discussed and further plans were made for community discussion and issue identification.

Press Release.- A press release was issued including general information about the immunization project, major results and findings, and other related information.

Presentation to immunization coalition. - The major results and information about the 1999 Clark County Childhood Immunization Study was presented to and discussed with the area's immunization coalition in June 2000.

Project Lessons Learned and Recommendations

There were many lessons learned and various recommendations for future projects. Some issues may be characteristic to Clark County and may not apply to other areas.

- ◆ Material borrowed from other local health jurisdictions and Washington State DOH who had been involved in similar projects was extremely useful. Even more useful were those versions of documents that were available electronically that could be changed and adapted for our use.
- ◆ Two people did the project coordination for the Clark County study. This was helpful since one of the project coordinators was available during all work sessions associated with the project. This dual effort was also useful because each person brought strengths and expertise from each respective discipline, nursing and epidemiology, that was important to the success of the project.
- ◆ It was hard to juggle other duties during the course of the project with all internal staff working on the project.
- ◆ Training was very useful to interviewers. More practicing of interview techniques would have been helpful.
- ◆ Interviewers learned to quickly adjust to whatever situation presented itself during either telephone interviews or field visits.
- ◆ Available materials needed to be developed at a reading level appropriate for general consumption.
- ◆ The use of a consultant for tracing the address and phone number of the families was invaluable to the project. DOH's support in hiring a consultant for these activities was critical.
- ◆ Post Offices and Fire Departments were helpful resources in locating hard to find addresses.
- ◆ It is important to have some level of community awareness about project before beginning parent contact portion. Press releases and mailings were helpful.
- ◆ There is some concern as to the benefit of sending an initial postcard versus sending an initial letter on official letterhead. A postcard mailing is less formal than a letter and may appeal to some people but not to others. Each local area should decide which might be better received in their community.
- ◆ The initial postcard mailing was targeted to arrive at homes on a day other than when flyers and advertisements arrive. We found that most of these mailings arrived at homes on Tuesday in Clark County.

- ❖ Most parents were very helpful and were glad to participate once they understood the need for the project. We did, however, find it harder to solicit participation from families who had moved away from the county.
- ❖ Some people were suspicious of telephone calls, authenticity of interviewers, and the need for medical information. In anticipation, we did have a telephone number that potential participants could call to verify the study.
- ❖ Some people we talked to were tired of all surveys.
- ❖ It was helpful to have someone familiar to the local health care provider offices as the contact person for all provider offices. One of the nurses in the clinic does vaccine distribution within the community and has a number years experience working with health care providers around vaccinations.
- ❖ Support from local health care providers was essential in the provider verification portion of the project. Their support for the project itself was also very important.
- ❖ A supportive and collaborative environment within the local health jurisdiction is crucial. It was important to have the full support of the agency's management. It was important to make sure all staff were also aware of the project. This was important so that all SWPHD staff were aware of the project and could verify its legitimacy.
- ❖ Interpreters and translated materials should be available for different sub-populations within the community.
- ❖ Non-English speaking respondents valued the opportunity to ask questions and express themselves through an interpreter.
- ❖ It was time-consuming to update information daily, but it was a necessary process.
- ❖ Operational definitions and guidelines for project coordination, interviewing and data collection, and data entry should be very specific and detailed in the beginning of the project or as soon as identified.
- ❖ Most pieces of the project took longer than anticipated, so try to incorporate more time than initially thought.
- ❖ Financial support from the Washington State Department of Health and private industries was extremely useful to the project.
- ❖ Although the project was coordinated and run locally, it was helpful to have DOH support throughout the project.

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Appendix A: Public Announcement

Southwest Washington Health District *Preserving, Promoting & Protecting Health in Clark and Skamania Counties.*

November 3, 1999

Contact: Barbara Riehm (360) 397-8215 ext. 3013
Melanie Payne (360) 397-8215 ext. 3014

Beginning in November, Southwest Washington Health District (SWWHD) will be conducting a countywide survey to learn about the immunization status of toddlers in Clark County. Over 200 homes with children age's 19 months to 35 months will be randomly selected for the survey. Parents will be notified by mail if their child is selected, and public health workers will conduct the telephone survey. In the survey, which will take 10 to 15 minutes, parents will be asked about their child's immunization history, health insurance and their experience getting immunizations for their child.

This survey will help public health officials measure the level of protection against disease and determine ways to encourage proper immunization of Clark County children. Nationwide 81% of all two-year olds are believed to be protected against preventable diseases such as diphtheria, pertussis (whooping cough), tetanus, measles, mumps, rubella, polio and haemophilus influenza type B. National and Washington State target goals are to have at least 90% of all two-year olds fully immunized by the year 2000.

"I suspect we will find out great news, that is, I believe that Clark County's children will have achieved higher immunization levels than ever before," stated Dr. Karen Steingart. "The prevention and control of infectious disease is critical to our community's health, and Southwest Washington Health District, community physicians, and many other partners have made immunizations, particularly childhood immunizations, a major priority."

State law requires children to be immunized against preventable disease by the time they enter school. However, preschool children are particularly vulnerable to measles, pertussis and haemophilis influenza, and preventable diseases that can be fatal to infants. Recommended immunizations for preschool children include four doses of the diphtheria, tetanus and pertussis (DPT) vaccine before they reach age two. A fifth dose is suggested between the ages of 4 and 6. Four doses of the haemophilis influenza (Hib) vaccine are suggested before a child reaches the age of two. A measles, mumps and rubella (MMR) vaccination is needed after a child's first birthday and a second MMR before entering school. Children should receive three doses of the polio vaccine before their second birthday, with a fourth dose between ages 4 and 6.

Appendix B: Postcard Mailing

Southwest Washington Health District

Preserving, Promoting & Protecting Health in Clark and Skamania Counties.

Please tell us about your child's immunizations!

Dear Parent or Guardian:

Your local health department, Southwest Washington Health District, has chosen **you** to take part in an important survey about childhood immunizations, shots, and vaccinations.

We will be contacting you by telephone within the next few weeks to do a short, 10-15 minute survey. All the information you give us will be kept confidential. Your child represents ten other children in Clark County.

Please take a few minutes now to find your child's immunization records so you will be ready when we call. If you have questions or there are any changes to your name or address, please call Melanie Payne at the Health Department, (360) 397-8215. Thank you for your help.

Sincerely,

Melanie Payne
Project Coordinator
Immunization Survey

Barbara Riehm
Project Coordinator
Immunization Survey

Southwest Washington Health District Assessment and Research Unit

Appendix C: "We Missed You" Letter

Southwest Washington Health District *Preserving, Promoting & Protecting Health in Clark and Skamania Counties.*

January _____, 2000

Dear Parent or Guardian of _____,

The health of Clark County's children is very important to the citizens of our county. To find out which vaccinations children have received, the Southwest Washington Health District and the Washington State Department of Health are conducting a vaccination study of 2 to 3 year olds in Clark County. Your child is one of a small number of children randomly selected from birth records for this project.

It is important that we learn which immunizations your child has received and your feelings about access to immunizations and health care providers. This information is very useful in helping to understand the level of immunizations among young children in the area and to identify some areas associated with childhood immunizations that may need improvements such as the cost of immunizations, transportation issues, or office hours of the health care providers. An interviewer has been trying to contact you by phone but has been unable to reach you.

All information given to the health department is confidential and you or your child will not be identified in this project. Results will be presented and used based on grouped information. Information you have about your child's immunization history is important to the study. The interview should take less than 10 minutes to complete.

We would appreciate a call from you letting us know how we can reach you and the best time to do so or if you are not the person we should contact. Please call Barbara Riehm at (360) 397-8215 ext. 3013 Monday through Friday between 8:15 am and 4:30pm.

Thank you,

Barbara Riehm, RN, BSN
Assessment Specialist

Appendix D: Subject Search Sheet

Clark County Birth Certificate Followback Survey Subject Search Sheet

Child ID Code: _____ Child's Name: _____

Mother's Information	Father's Information	Last Known Address
First:	First:	
Last:	Last:	
LKTelephone #:		

@ Please verify address:

Address Verification	Source	Status of Consent Form Agreed to Sign Yes/No	Date Sent	Date Returned

A) Postal Service. B) National Change of Address. C) Neighbor. D) Phone contact or message. E) Other (specify).

, Postcard Mailings:

Date	Outcome Code	Outcome Date
First mailing (introduction):		
Second mailing:		
Third mailing:		
Thank you postcard:		

F) Not deliverable as addressed. G) Moved - no forwarding address. H) Moved - received address correction. I) Forwarding expired.
J) Not returned. K) Phoned to complete survey. L) Requested translation (specify). M) Other (specify).

(Phone Calls:

	Date	Time	Status of Attempt	Comments	Interviewer Initials
1 st Call:					
2 nd Call:					
3 rd Call:					
4 th Call:					
5 th Call:					
6 th Call:					
7 th Call:					
8 th Call:					
9 th Call:					
10 th Call:					

V) Completed survey. W) Refused to complete survey. X) Wrong number. Y) No contact. Z) No contact - left message. AA) Requested survey by mail or visit. BB) Requested translation (specify). CC) Other (specify).

! Visits:

Date	Outcome Code	Outcome Date
First visit:		
Second visit:		

N) Completed survey. O) Refused to complete survey. P) No contact - left Hello Letter. Q) Moved - no forwarding address.
R) Moved - received address correction. S) Requested survey by mail or telephone. T) Requested translation (specify). U) Other (specify).

+ Survey Mailings:

Date	Outcome Code	Outcome Date
First mailing of survey:		
Second mailing of survey:		

DD) Completed and returned survey. EE) Not deliverable as addressed. FF) Moved - no forwarding address. GG) Moved - received address correction. HH) Not returned. II) Phoned to complete survey. JJ) Requested translation (specify). KK) Other (specify).

Record of Activity

☐ Postal Service -

Name:

Address:

Phone:

☐ National Change of Address -

Name:

Address:

Phone:

☐ CD-ROM -

Name:

Address:

Phone:

☐ Phone Book -

Name:

Address:

Phone:

☐ WIC -

Name:

Address:

Phone:

☐ DMV -

Name:

Address:

Phone:

☐ Equifax -

Name:

Address:

Phone:

☐ Telematch -

Name:

Address:

Phone:

☐ Marriage and Divorce Files -

Name:

Address:

Phone:

☐ New Address from Phone Call -

Name:

Address:

Phone:

☐ Other (specify) -

Name:

Address:

Phone:

☐ Other (specify) -

Name:

Address:

Phone:

Appendix E: Survey Instrument



Child ID:

Interviewer ID:

Date: / /

Time Start: :

SECTION I. CHILD INFORMATION	Response
1. What is the child's name?	
2. Is (CHILD'S NAME) a boy or a girl?	<input type="radio"/> boy <input type="radio"/> girl
3. What is (CHILD'S NAME)'s date of birth?	<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/>
4. How many older brothers or sisters does (CHILD'S NAME) have living in your household?	<input type="text"/> <input type="text"/>
5. How many younger brothers or sisters does (CHILD'S NAME) have living in your household?	<input type="text"/> <input type="text"/>
6. In what month and year did (CHILD'S NAME) last live in Washington State?	<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/>
7. In what month and year did (CHILD'S NAME) last live in Clark County?	<input type="text"/> <input type="text"/> / <input type="text"/> <input type="text"/>
8. How many times has (CHILD'S NAME) moved since birth?	<input type="text"/> <input type="text"/>
9. What is your relationship to (CHILD'S NAME)? <input type="radio"/> Mother <input type="radio"/> Father <input type="radio"/> Grandmother <input type="radio"/> Grandfather <input type="radio"/> Other [SPECIFY]	
10. Are you the primary caregiver? <input type="radio"/> Yes <input type="radio"/> No, If No, who is? [Specify]	
11. Who usually takes (CHILD'S NAME) for their immunizations? [Mark one or two] <input type="radio"/> Mother <input type="radio"/> Father <input type="radio"/> Grandmother <input type="radio"/> Grandfather <input type="radio"/> Other [SPECIFY]	

Next, I'd like to ask about (CHILD'S NAME)'s health care and immunizations.

SECTION II. HEALTH CARE AND IMMUNIZATIONS	Response
12. At the time of (CHILD'S NAME)'s birth, did you have a health care provider selected for (HIM/HER)? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't Know	
13. At this time, does (CHILD'S NAME) have a regular health care provider? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
14. Where does (CHILD'S NAME) usually get (HIS/HER) medical care? [Read List & Mark One] <input type="radio"/> Kaiser <input type="radio"/> Hospital Emergency Room <input type="radio"/> Other [SPECIFY] <input type="radio"/> Doctor/Private Provider (other than Kaiser) <input type="radio"/> Urgent Care Clinics <input type="radio"/> Refused <input type="radio"/> Community Health Clinic (free clinic) <input type="radio"/> None <input type="radio"/> Don't know	
15. Between birth and 19 months of age - that's the first year-and-a-half of life, what type of medical insurance did (CHILD'S NAME) have? [Read List & Mark All That Apply] <input type="radio"/> Kaiser <input type="radio"/> State Basic Health Plan <input type="radio"/> Other [SPECIFY] <input type="radio"/> HMO/Managed Care (other than Kaiser) <input type="radio"/> Healthy Options, Medical Coupon, <input type="radio"/> Refused <input type="radio"/> Private Insurance or Medicaid <input type="radio"/> Don't know <input type="radio"/> None	
16. Has (CHILD'S NAME) ever been given any vaccinations or immunizations by mouth or by shot? <input type="radio"/> Yes <input type="radio"/> No [SKIP TO SECTION IV]	
17. I am going to read you a list of places where children get immunizations. Please tell me if (CHILD'S NAME) got immunizations at any of these. [Read list & Mark All That Apply] <input type="radio"/> Kaiser <input type="radio"/> Health Department <input type="radio"/> None <input type="radio"/> Doctor/Private Provider (other than Kaiser) <input type="radio"/> Hospital Emergency Room <input type="radio"/> Other [SPECIFY] <input type="radio"/> Community Health Clinic (free clinic) <input type="radio"/> Hospital at Birth <input type="radio"/> Refused <input type="radio"/> Urgent Care Center <input type="radio"/> Don't know	
18. Have you ever been given a card or record of the immunizations that (CHILD'S NAME) has received? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know [No & Don't Know SKIP TO SECTION IV]	

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19. I would like to record the dates listed on the cards. Could you please get all of (CHILD'S NAME)'s immunization records or cards? **[DO NOT READ OPTIONS]**

☐ Yes ☐ No **[SKIP TO SECTION IV]**

SECTION III. IMMUNIZATION HISTORY

Vaccine	[RECORD DATE AS MM/DD/YY]			
	A. Dose 1	B. Dose 2	C. Dose 3	D. Dose 4
20. Diphtheria/Tetanus/Pertussis (DTP) <i>may be listed as: DT, DTaP, ACEL-IMUNE, Tripedia, Infanrix, Tetramune</i>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>
21. Oral Polio Vaccine/Inactivated Polio Vaccine (OPV/IPV) <i>may be listed as: Orimune, IPOL, eIPV, TOPV</i>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>
22. Measles/Mumps/Rubella (MMR)	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>
23. Haemophilus Influenza Type b (HIB) <i>may also be listed as: PedvaxHIB, HibTiter, ActHib, COMVAX</i>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>
24. Hepatitis B (HEP B) <i>may also be listed as: Recombivax, Engerix-B, COMVAX</i>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>
25. Varicella <i>may also be listed as: Chickenpox, Varivax</i>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>
26. Other [SPECIFY]	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>
27. Other [SPECIFY]	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>	<input type="text"/> / <input type="text"/> / <input type="text"/>

Next, I have questions about experiences you had getting (Child's Name) immunized.

SECTION IV. IMMUNIZATION EXPERIENCES	Response
28. Do you usually know when it is time for (CHILD'S NAME) to go for immunizations? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
29. Do you keep a copy of the recommended immunization schedule at home? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
30. Do you currently receive CHILD Profile materials? [READ EXAMPLE] <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
31. Since (CHILD'S NAME) was born, have you ever received a mail or telephone reminder to schedule or to keep any of (HIS/HER) "well baby" or immunization appointments? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
32. Have you had problems scheduling an appointment for (CHILD'S NAME)'s immunizations? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know <input type="radio"/> Not Applicable	
33. Have you had problems getting (CHILD'S NAME)'s immunizations due to doctor or clinic hours? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know <input type="radio"/> Not Applicable	
34. Have you ever had transportation problems getting (CHILD'S NAME) to the doctor or clinic for shots? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know <input type="radio"/> Not Applicable	
35. Did you or someone else have to take time off from work to go to the doctor or clinic for (CHILD'S NAME)'s shots? <input type="radio"/> Yes <input type="radio"/> No [SKIP TO Q37] <input type="radio"/> Don't know [SKIP TO Q37] <input type="radio"/> Not Applicable	
36. [IF YES] Was it difficult for you or them to obtain time off from work? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
37. Was the cost of obtaining immunizations ever a problem? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know <input type="radio"/> Not Applicable	



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38. Has a doctor or health care provider ever sent you somewhere else for (CHILD'S NAME)'s immunizations? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know <input type="radio"/> Not Applicable	
39. Did you need to schedule a "well baby" visit in order for (CHILD'S NAME) to be immunized? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know <input type="radio"/> Not Applicable	
40. During any of (CHILD'S NAME)'s doctor or clinic visits, did (HE/SHE) not get immunized when you expected (HIM/HER) to be? <input type="radio"/> Yes <input type="radio"/> No [SKIP TO Q42] <input type="radio"/> Don't know [SKIP TO Q42]	
41. [IF YES] Why weren't those vaccines given during any of those visits? [Mark all that apply] <input type="radio"/> The health care provider thought (He/She) was too sick <input type="radio"/> Other [SPECIFY] <input type="radio"/> Don't know <input type="radio"/> It was too soon for another vaccination <input type="radio"/> Not enough time during the visit	
42. During doctor or clinic visits, did any of the following occur? [Mark all that apply] <input type="radio"/> The health care provider recommended immunizations for (CHILD'S NAME)? <input type="radio"/> You needed to request immunizations for (CHILD'S NAME)? <input type="radio"/> Don't know <input type="radio"/> Not Applicable	
43. Did you have any other problems in getting (CHILD'S NAME) immunizations that we have not already asked about? <input type="radio"/> Yes [SPECIFY] <input type="radio"/> No <input type="radio"/> Don't know	
44. Do you have any personal, philosophical or religious reasons for why some immunizations should not be given to (CHILD'S NAME)? <input type="radio"/> Yes [SPECIFY] <input type="radio"/> No <input type="radio"/> Don't know	
45. Between birth and age 19 months - that's during the first year-and-a-half of life, did (CHILD'S NAME) regularly attend childcare/daycare? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
46. Has (CHILD'S NAME) ever been excluded from childcare/daycare for lack of immunizations? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
47. Between birth and age 19 months - that's during the first year-and-a-half of life, was (CHILD'S NAME) ever enrolled in the Women, Infants, and Children, or WIC program? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
48. Between birth and age 19 months - that's during the first year-and-a-half of life, was (CHILD'S NAME) ever enrolled in the Aid to Families with Dependent Children, AFDC, or Temporary Assistance for Needy Families, TANF, programs? <input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Don't know	
49. Thinking about (CHILD'S NAME)'s second year of life, that is, from age 12 through 23 months, how many times did (CHILD'S NAME) see a health care provider? [READ NUMBERS & MARK ONE] <input type="radio"/> 0 - None <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 or more	

Thank you, we are almost done. The next questions relate to (YOU/THE CHILD'S PRIMARY CAREGIVER).

SECTION V. DEMOGRAPHIC INFORMATION	Response
50. What is (YOUR/HER/HIS) date of birth? <input type="radio"/> Refused <input type="radio"/> Don't know	<input type="text"/> / <input type="text"/> / <input type="text"/>
51. What is the highest grade or level of school (YOU HAVE/SHE HAS/HE HAS) completed? <input type="radio"/> None <input type="radio"/> High school grad./GED <input type="radio"/> Grad./Professional School <input type="radio"/> Other [SPECIFY] <input type="radio"/> 1st - 8th grade <input type="radio"/> Some college <input type="radio"/> Technical/Vocational School <input type="radio"/> Refused <input type="radio"/> 9th - 12th grade <input type="radio"/> College graduate <input type="radio"/> Don't know	
52. What is (YOUR/HER/HIS) marital status? <input type="radio"/> Single, never married <input type="radio"/> Live-in partner <input type="radio"/> Widowed <input type="radio"/> Don't know <input type="radio"/> Married <input type="radio"/> Separated/Divorced <input type="radio"/> Refused	
53. Here is a list of employment categories. Which categories best describe (YOUR/HER/HIS) employment status during (CHILD'S NAME)'s first year-and-a-half of life? [READ LIST & Mark all that apply] <input type="radio"/> Employed full-time <input type="radio"/> Self-employed <input type="radio"/> Not employed <input type="radio"/> Employed part-time <input type="radio"/> Retired <input type="radio"/> Refused <input type="radio"/> Seasonal employment <input type="radio"/> Student <input type="radio"/> Don't know	

<p>54. Are (YOU/IS SHE/IS HE) of Hispanic origin?</p> <p> <input type="radio"/> Yes, Mexican, Mexican Am., Chicano <input type="radio"/> Yes, Puerto Rican <input type="radio"/> No <input type="radio"/> Don't know <input type="radio"/> Yes, other Spanish/Hispanic/Latino [Specify] <input type="radio"/> Yes, Cuban <input type="radio"/> Refused </p>	
<p>55. What race (DO YOU/DOES SHE/DOES HE) consider (YOURSELF/HERSELF/HIMSELF)?</p> <p>[Mark one or more races to indicate what the person considers himself/herself to be]</p> <p> <input type="radio"/> White <input type="radio"/> Vietnamese <input type="radio"/> Black, African Am., or Negro <input type="radio"/> Other Asian [SPECIFY] <input type="radio"/> American Indian or Alaska Native [SPECIFY TRIBE] <input type="radio"/> Native Hawaiian <input type="radio"/> Asian Indian <input type="radio"/> Guamanian or Chamorro <input type="radio"/> Chinese <input type="radio"/> Samoan <input type="radio"/> Filipino <input type="radio"/> Refused <input type="radio"/> Other Pacific Islander [SPECIFY] <input type="radio"/> Japanese <input type="radio"/> Don't know <input type="radio"/> Some other race [SPECIFY] <input type="radio"/> Korean </p>	
<p>56. What is the primary language spoken in your household?</p> <p> <input type="radio"/> English <input type="radio"/> Cambodian <input type="radio"/> Ukrainian <input type="radio"/> Don't know <input type="radio"/> Spanish <input type="radio"/> Laotian <input type="radio"/> Other [SPECIFY] <input type="radio"/> Vietnamese <input type="radio"/> Russian <input type="radio"/> Refused </p>	
<p>57. Including all of the adults and all of the children, how many people live in your household?</p>	<div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div> <div style="border: 1px solid black; width: 20px; height: 20px; display: inline-block;"></div>
<p>58. Here is a list of income categories. Which category best describes the annual combined household income, before taxes, during (CHILD'S NAME)'s first year of life? [READ LIST & MARK ONE]</p> <p> <input type="radio"/> <\$10,000 <input type="radio"/> \$20,000 - \$24,999 <input type="radio"/> \$35,000 - \$39,999 <input type="radio"/> \$50,000 - \$59,999 <input type="radio"/> \$10,000 - \$14,999 <input type="radio"/> \$25,000 - \$29,999 <input type="radio"/> \$40,000 - \$44,999 <input type="radio"/> >\$60,000 <input type="radio"/> \$15,000 - \$19,999 <input type="radio"/> \$30,000 - \$34,999 <input type="radio"/> \$45,000 - \$49,999 <input type="radio"/> Refused <input type="radio"/> Don't know </p>	
<p>59. We would like your permission to obtain copies of your child's immunization records from the places where (HIS/HER) shots were given. Would you sign a consent form for this?</p> <p> <input type="radio"/> Yes [SKIP TO CONSENT FORM] <input type="radio"/> No </p>	
<p>60. [IF NO] Is there any particular reason why you would prefer that I not get this information from your doctor? [RECORD REASON VERBATIM]</p>	

This completes the interview. Thank you very much for answering the questions. Please feel free to contact the health district if you have any questions or comments concerning our survey.

Time Finish :

Appendix F: Consent for Release of Medical (Immunization) Records Form

Southwest Washington Health District
1999 CLARK COUNTY IMMUNIZATION SURVEY
P.O. BOX 1870, VANCOUVER, WA 98668-1870

CONSENT FOR RELEASE OF MEDICAL RECORDS

I hereby authorize and request the following health care providers to release copies of the complete immunization record of my child:

Child's Name _____ Child's DOB ____/____/____
Last, First Middle mm dd

PLEASE PRINT PARENT'S/GUARDIAN'S NAME HERE _____

Parent's/Guardian's

Signature _____ Date _____

Relationship to Child _____

Parent's/Guardian's/Subscriber's SSN _____

Sponser's Number (Military) _____

1. Name of Health Care Facility _____

Doctor's Name _____

Address _____

Telephone _____

Patient Subscriber's Number/SSN _____

2. Name of Health Care Facility _____

Doctor's Name _____

Address _____

Telephone _____

Patient Subscriber's Number/SSN _____

3. Name of Health Care Facility _____

Doctor's Name _____

Address _____

Telephone _____

Patient Subscriber's Number/SSN _____

4. Name of Health Care Facility _____

Doctor's Name _____

Address _____

Telephone _____

Patient Subscriber's Number/SSN _____

This authorization shall remain valid for 90 days and may be revoked at any time upon written notification, except to extent action has already been taken.

Appendix G: Contract for Tracing Services

PROFESSIONAL SERVICES AGREEMENT

For Alisa D. Katai, MHA, Tracing Services, Services

THIS AGREEMENT is entered into by and between the Southwest Washington Health District, hereinafter referred to as "District" and Alisa D. Katai, MHA, hereinafter referred to as "Contractor," 936 NW 57th St., Seattle, WA 98107.

PERIOD OF PERFORMANCE

The period of performance of this Agreement shall commence on or about October 1, 1999, and be completed on December 31, 1999, unless terminated sooner as herein provided. **The maximum consideration for this contract shall not exceed \$5,000.**

PURPOSE

The District desires to purchase the services of Alisa D. Katai to provide assistance in locating 250 children and their families selected through a "birth certificate followback" random sampling methodology. This type of methodology yields data that is at least one to three years old. Thus requiring the need for investigation to determine many families current whereabouts. In order to complete this study on time, the services of Ms. Katai are necessary as she possesses unique skills in this type of tracing. The Contractor is Alisa D. Katai, MHA. Ms. Katai has previous experience with the Washington State Department of Health, as an independent contractor of tracing services for a similar project. She has established practices, relationships, and access to many of the state and national databases needed to find these families. Therefore, the District and the Contractor enter into this Agreement.

STATEMENT OF WORK

1. Establish access to data with a variety of Washington State Agencies, including: DSHS, DOL, CPS, Vital Records (Marriage and Divorce), and others if available.
2. Perform individual database searches on sampled names at state agency offices that require the project to provide the staff
3. Produce requests for information from the United States Postal Service under the Freedom of Information Act.
4. Perform internet searches and statewide/national phone directory searches as necessary.
5. Provide training to project coordinator and surveyors on tracing activities and techniques.
6. Develop and maintain a database to document, track, and manage all tracing data.
1. Communicate directly and often with surveyors in the field to efficiently share information that will maximize tracing results.
2. Provide regular reports on tracing results and independent consultant's activities.
3. If deemed necessary, make two trips from Seattle, Washington, to Vancouver, Washington to meet with and consult with project staff

CONTRACTOR NOT EMPLOYEE OF THE DISTRICT

Contractor shall be deemed to be an independent contractor and not an employee of the District. The Contractor shall be responsible for all federal and/or state tax, industrial insurance, and Social Security Liability that may result from the performance of and compensation for these services and shall make no claim of career service or civil service rights which may accrue to a District employee under state or local law.

DISPUTE RESOLUTION

All disputes concerning or arising out of this contract except an action for unlawful detainer shall be resolved through arbitration. The arbitration shall take place in Clark County, Washington, and governed by RCW 7.04 and Rule 4.1-6.1 and 8.1-8.5 of the Mandatory Arbitration Rules of the State of Washington. The arbitration shall be to a single person selected from among those persons qualified to act as arbitrators by the Superior Court for Clark County, Washington, if the persons cannot agree. The Arbitrator's costs and expenses shall be paid by the nonprevailing party. In a litigation or arbitration, the prevailing party shall be entitled to an award of attorney's fees and all costs incurred.

NONDISCRIMINATION

Nondiscrimination in Employment: The Contractor shall not discriminate against any employee or applicant for employment because of race, color, sex, religion, national origin, sexual preference, creed, marital status, age, Vietnam era or disabled veteran status, or the presence of any sensory, mental or physical handicap.

Nondiscrimination in Service Delivery: The Contractor shall not discriminate against any client, patient, or user of service because of race, color, sex, religion, national origin, sexual preference, creed, marital status, age, Vietnam era or disabled veteran status, or the presence of any sensory, mental or physical handicap.

HOLD HARMLESS

All services rendered under this Contract will be performed entirely at the Contractor's own risk as an independent Contractor.

CONFIDENTIALITY

The use or disclosure by any party of any information concerning a client for any purpose not directly connected with the contractors responsibility under this agreement is prohibited.

STATUTORY AND REGULATORY COMPLIANCE

The Contractor, in the performance of this contract, agrees to comply with all applicable federal, state, and local laws, ordinances, rules, regulations, guidelines and standards applicable to any service provided pursuant to this Agreement.

The Contractor represents that they are fully qualified and possesses all necessary licenses to perform the services pursuant to this Agreement.

The Contractor represents that they are fully qualified and possesses all necessary licenses to perform the services described in this Agreement.

REIMBURSEMENT

The District will pay the Contractor one time per month upon receipt of an invoice outlining the professional services, travel and other expenses as outlined in the attached budget. Not to exceed five thousand dollars (\$5,000.00) for the entire contract.

NOTICES AND BILLINGS

All notices or billings shall be deemed delivered by personal delivery, or by depositing in the regular United States mail, postage prepaid, to the following address.

Bonnie J. Kostecky, RN, MS, MPA
S W Washington Health District
2000 Fort Vancouver Way
PO Box 1870
Vancouver WA 98668

TERMINATION OF AGREEMENT

This Agreement may be terminated by either party upon thirty (30) days written notice to the other party. If this contract is terminated for any reason, the District shall be liable only for payment in accordance with the terms of this Contract for services rendered prior to the effective date of termination.

CHANGES AND MODIFICATIONS

The Contractor and the District may mutually amend this Agreement. Such amendments shall not be binding unless they are in writing and signed by personnel authorized to bind the District and the Contractor.

SEVERABILITY

If any provision of this Agreement or any provision of any document incorporated by reference shall be held invalid, such invalidity shall not affect the other provisions of this Agreement which can be given effect without the invalid provision.

ALL WRITING CONTAINED HEREIN

This Agreement contains all the terms and conditions agreed upon by the parties. No other understandings, oral or otherwise, regarding the subject matter of this Agreement shall be deemed to exist or to bind any of the parties hereto.

BUDGET FOR TRACING SERVICES

Professional Services	\$3,776.00
2 Trips to Vancouver, WA (includes air and ground travel, hotel, and per diem)	\$400.00
Tracing Fees	\$486.00
National Change of Address	
Vital Statistics	
Other	
Additional Expenses	\$338.00
Long Distance Charges	
Internet Access	
Copying Charges	
Other	
Total	\$5,000.00

SOUTHWEST WASHINGTON HEALTH DISTRICT

CONTRACTOR

K. Kay Koontz, Executive Director

Alisa D. Katai, MHA

Date

Date